

SERVICE MANUAL

BA-5 CHASSIS

<u>MODEL NAME</u>	<u>REMOTE COMMANDER</u>	<u>DESTINATION</u>	<u>CHASSIS NO.</u>
KV-13FM13	RM-Y172	Canada	SCC-S41N-A



KV-13FM13



RM-Y172

TRINITRON® COLOR TELEVISION

SONY®

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SPECIFICATIONS

Power Requirements

120V, 60Hz

Number of Inputs/Outputs

Video ¹⁾	2
Audio ²⁾	2
Headphone Out	1
Speaker Output	3W

¹⁾ (1 Vp-p 75 ohms unbalanced, sync negative)

²⁾ (500 Vrms (100% modulation), Impedance: 47 kilohms)

Power Consumption

In Use (Max)	80W
In Standby	1W

Dimensions (W x H x D)

450 x 338 x 438 mm
 17 ^{3/4} x 13 ^{3/8} x 17 ^{1/4} in

Mass

12 kg
 26 lbs 7 oz.

Television system

American TV standard, NTSC

Channel coverage

VHF: 2-13/ VHF: 14-69/ CATV: 1-125

Picture tube

Trinitron[®] tube

Visible screen size

13" inch picture measured diagonally

Actual screen size

14" inch measured diagonally

Antenna

75 ohm external terminal for VHF/UHF

Supplied Accessories

Remote Commander RM-Y172
 Size AA (R6) batteries (2)

Design and specifications are subject to change without notice.

WARNINGS AND CAUTIONS


CAUTION

Short circuit the anode of the picture tube and the anode cap to the metal chassis, crt shield, or carbon painted on the crt, after removing the anode.

WARNING!!

An isolation transformer should be used during any service to avoid possible shock hazard, because of live chassis. The chassis of this receiver is directly connected to the ac power line.

SAFETY-RELATED COMPONENT WARNING!!


Components identified by shading and  mark on the schematic diagrams, exploded views, and in the parts list are critical for safe operation. Replace these components with sony parts whose part numbers appear as shown in this manual or in supplements published by sony. Circuit adjustments that are critical for safe operation are identified in this manual. Follow these procedures whenever critical components are replaced or improper operation is suspected.

ATTENTION!!

Après avoir déconnecté le cap de l'anode, court-circuiter l'anode du tube cathodique et celui de l'anode du cap au châssis métallique de l'appareil, ou la couche de carbone peinte sur le tube cathodique ou au blindage du tube cathodique.

Afin d'éviter tout risque d'électrocution provenant d'un châssis sous tension, un transformateur d'isolement doit être utilisé lors de tout dépannage. Le châssis de ce récepteur est directement raccordé à l'alimentation du secteur.

ATTENTION AUX COMPOSANTS RELATIFS A LA SECURITE!!

Les composants identifiés par une trame et par une marque  sur les schémas de principe, les vues explosées et les listes de pièces sont d'une importance critique pour la sécurité du fonctionnement. Ne les remplacer que par des composants sony dont le numéro de pièce est indiqué dans le présent manuel ou dans des suppléments publiés par sony. Les réglages de circuit dont l'importance est critique pour la sécurité du fonctionnement sont identifiés dans le présent manuel. Suivre ces procédures lors de chaque remplacement de composants critiques, ou lorsqu'un mauvais fonctionnement suspecte.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are “pinched” or touching high-wattage resistors.
3. Check that all control knobs, shields, covers, ground straps, and mounting hardware have been replaced. Be absolutely certain that you have replaced all the insulators.
4. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
5. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
6. Check the line cords for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
7. Check the B+ and HV to see if they are specified values. Make sure your instruments are accurate; be suspicious of your HV meter if sets almost always have low HV.
8. Check the antenna terminals, metal trim, “metallized” knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

Leakage Test

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instructions.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The “limit” indication is 0.75 V, so analog meters must have an accurate low voltage scale. The Simpson's 250 and Sanwa SH-63TRD are examples of passive VOMs that are suitable. Nearly all battery-operated digital multimeters that have a 2 VAC range are suitable (see Figure A).

How to Find a Good Earth Ground

A cold-water pipe is a guaranteed earth ground; the cover-plate retaining screw on most AC outlet boxes is also at earth ground. If the retaining screw is to be used as your earth ground, verify that it is at ground by measuring the resistance between it and a cold-water pipe with an ohmmeter. The reading should be zero ohms.

If a cold-water pipe is not accessible, connect a 60- to 100-watt trouble-light (not a neon lamp) between the hot side of the receptacle and the retaining screw. Try both slots, if necessary, to locate the hot side on the line; the lamp should light at normal brilliance if the screw is at ground potential (see Figure B).

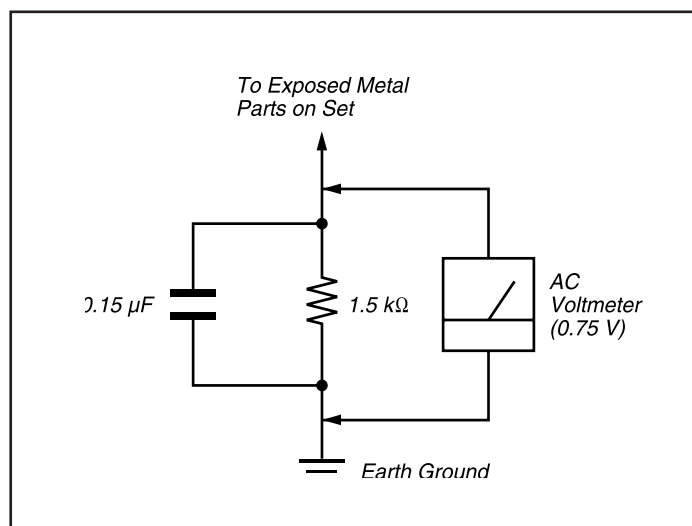


Figure A. Using an AC voltmeter to check AC leakage.

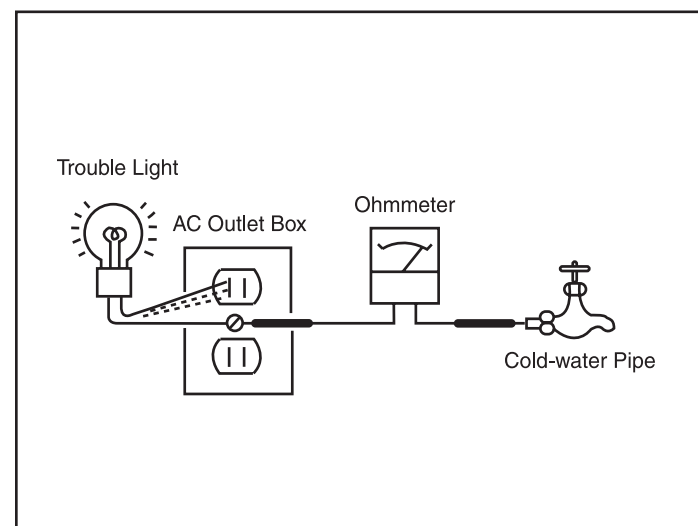


Figure B. Checking for earth ground.

SELF-DIAGNOSTIC FUNCTION



The units in this manual contain a self-diagnostic function. If an error occurs, the STANDBY/TIMER LED will automatically begin to flash. The number of times the LED flashes translates to a probable source of the problem. A definition of the STANDBY/TIMER LED flash indicators is listed in the instruction manual for the user's knowledge and reference. If an error symptom cannot be reproduced, the Remote Commander can be used to review the failure occurrence data stored in memory to reveal past problems and how often these problems occur.

Diagnostic Test Indicators

When an error occurs, the STANDBY/TIMER LED will flash a set number of times to indicate the possible cause of the problem. If there is more than one error, the LED will identify the first of the problem areas.

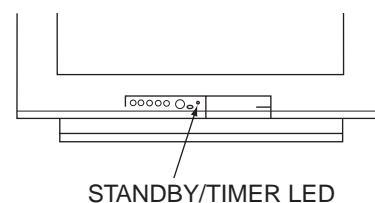
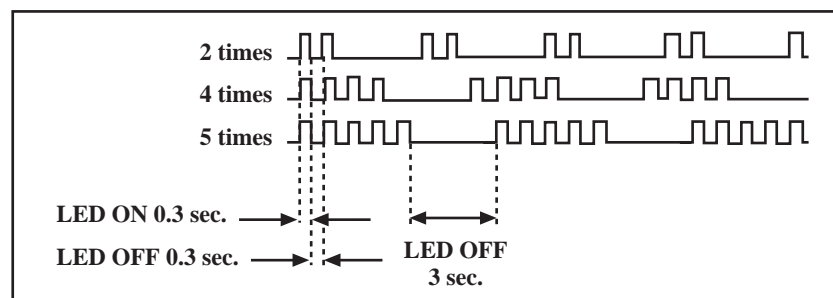
Results for all of the following diagnostic items are displayed on screen. If the screen displays a "0", no error has occurred.

Diagnostic Item	No. of times STANDBY/TIMER lamp flashes	Display Result	Probable Cause Location	Detected Symptoms
Power does not turn on	Does not light	_____	<ul style="list-style-type: none"> Power cord is not plugged in. Fuse is burned out (F601) (A Board) 	<ul style="list-style-type: none"> Power does not come on. No Power is supplied to the TV. AC power supply is faulty.
+B overcurrent (OCP)*	2 times	2:0 or 2:1	<ul style="list-style-type: none"> H.OUT (Q502) is shorted (A Board) IC702 is shorted. (CB Board) 	<ul style="list-style-type: none"> Power does not come on. Load on power line is shorted.
I-Prot*	4 times	4:0 or 4:1	<ul style="list-style-type: none"> +13V is not supplied. (A Board) IC502 is faulty. (A Board) 	<ul style="list-style-type: none"> Has entered standby state after horizontal raster. Vertical deflection pulse is stopped. Power line is shorted or power supply is stopped.
IK	5 times	5:0 or 5:1	<ul style="list-style-type: none"> Video OUT (IC502) is faulty. (A Board) IC1301 is faulty. (MB Board) Screen (G2) is improperly adjusted. ** 	<ul style="list-style-type: none"> No raster is generated. CRT cathode current detection reference pulse output is small.

* If a +B overcurrent is detected, stoppage of the vertical deflection is detected simultaneously. The symptom that is diagnosed first by the microcontroller is displayed on the screen.

** Refer to Screen (G2) Adjustments in Section 3-4 of this manual.

Display of Standby/Timer LED Flash Count



Diagnostic Item	Flash Count*
+B overcurrent	2 times
I-Prot	4 times
IK	5 times

*One flash count is not used for self-diagnostic.

Stopping the Standby/Timer LED Flash

Turn off the power switch on the TV main unit or unplug the power cord from the outlet to stop the STANDBY/TIMER LAMP from flashing.

Self-Diagnostic Screen Display

For errors with symptoms such as "power sometimes shuts off" or "screen sometimes goes out" that cannot be confirmed, it is possible to bring up past occurrences of failure on the screen for confirmation.

To Bring Up Screen Test

In standby mode, press buttons on the Remote Commander sequentially, in rapid succession, as shown below:

Display → Channel 5 → Sound Volume* → Power ON

*Note that this differs from entering the service mode (sound volume +)

Self-Diagnostic Screen Display

SELF DIAGNOSIS	
2: +B OCP	N/A
3: +B OVP	N/A
4: VSTOP	0
5: AKB	1
101: WDT	24

Numeral "0" means that no fault was detected.

Numeral "1" means a fault was detected one time only.

Handling of Self-Diagnostic Screen Display

Since the diagnostic results displayed on the screen are not automatically cleared, always check the self-diagnostic screen during repairs. When you have completed the repairs, clear the result display to "0".

Unless the result display is cleared to "0", the self-diagnostic function will not be able to detect subsequent faults after completion of the repairs.

Clearing the Result Display

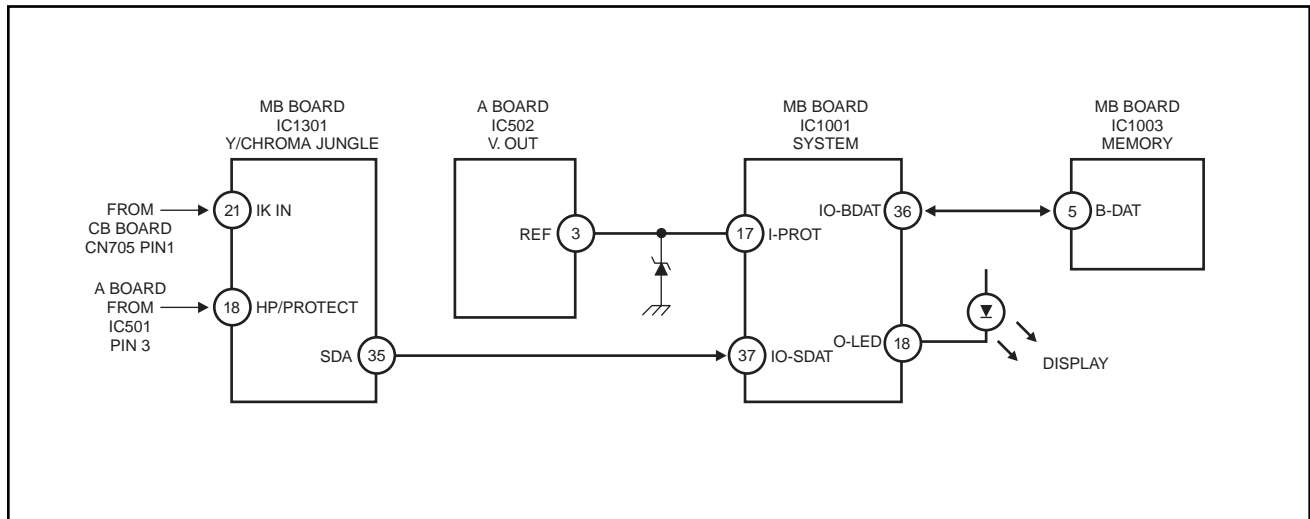
To clear the result display to "0", press buttons on the Remote Commander sequentially when the diagnostic screen is displayed, as shown below:

Channel 8 → ENTER

Quitting the Self-Diagnostic Screen

To quit the entire self-diagnostic screen, turn off the power switch on the Remote Commander or the main unit.

Self-Diagnostic Circuit



+B overcurrent (OCP)

Occurs when an overcurrent on the +B (135V) line is detected by pin 18 of IC1301 (MB Board). If the voltage of pin 18 of IC1301 (MB Board) is less than 1V when V.SYNC is more than seven verticals in a period, the unit will automatically turn off.

I-Prot

Occurs when an absence of the vertical deflection pulse is detected by pin 17 of IC1001 (MB Board). Power supply will shut down when waveform interval exceeds 2 seconds.

IK

If the RGB levels* do not balance within 2 seconds after the power is turned on, this error will be detected by IC1301 (MB Board). TV will stay on, but there will be no picture.

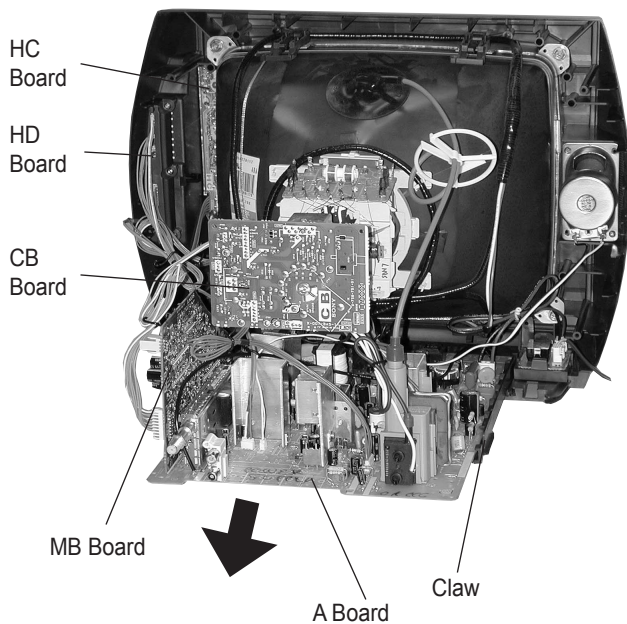
*(Refers to the RGB levels of the AKB detection Ref pulse that detects 1K).

SECTION 1: DISASSEMBLY

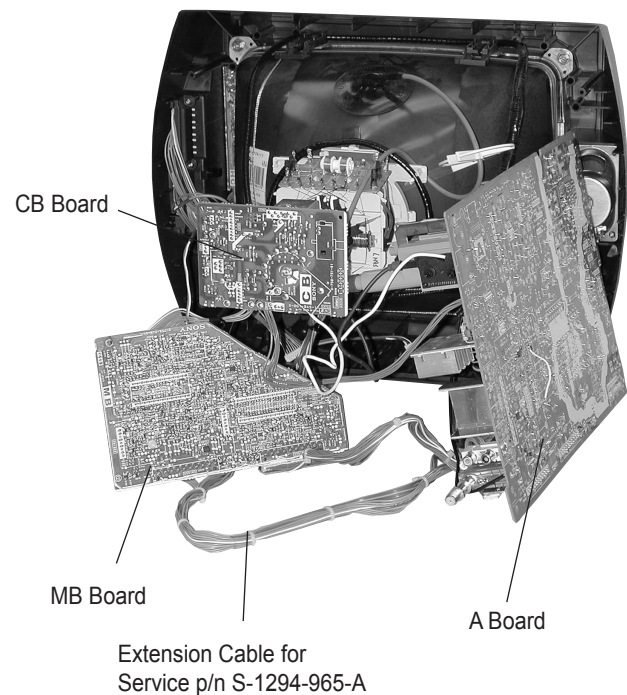
1-1. REAR COVER REMOVAL



1-2. CHASSIS ASSEMBLY REMOVAL



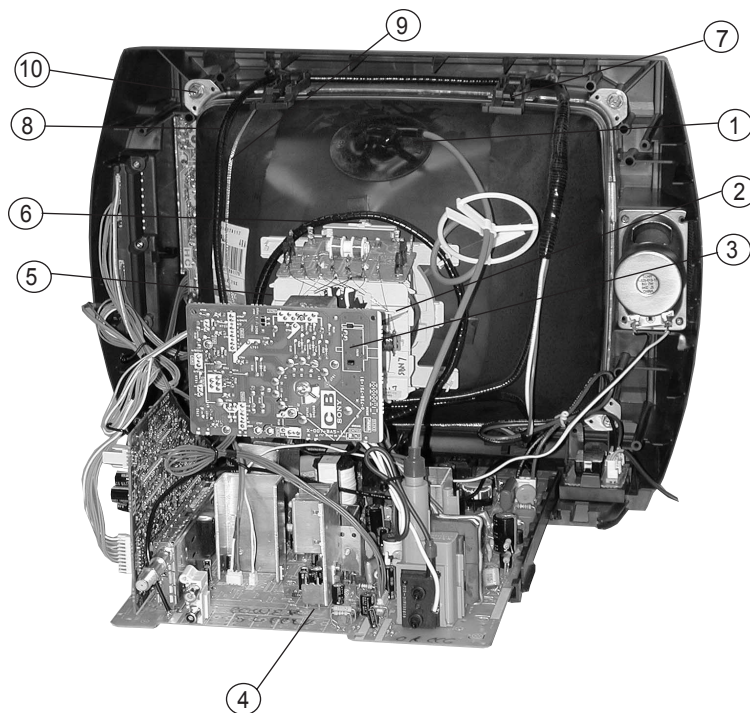
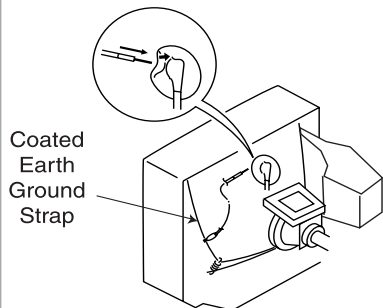
1-3. SERVICE POSITION



1-4. PICTURE TUBE REMOVAL

WARNING: BEFORE REMOVING THE ANODE CAP

High voltage remains in the CRT even after the power is disconnected. To avoid electric shock, discharge CRT before attempting to remove the anode cap. Short between anode and CRT coated earth ground strap.

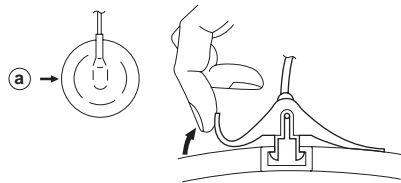


1. Discharge the anode of the CRT and remove the anode cap.
2. Unplug all interconnecting leads from the deflection yoke, neck assembly, degaussing coils and CRT grounding strap.
3. Remove the CB Board from the CRT.
4. Remove the chassis assembly.
5. Loosen the neck assembly fixing screw and remove.
6. Loosen the deflection yoke fixing screw and remove.
7. Place the set with the CRT face down on a cushion and remove the degaussing coil holders.
8. Remove the degaussing coils.
9. Remove the CRT grounding strap and spring tension devices.
10. Unscrew the four CRT fixing screws [located on each CRT corner] and remove the CRT [Take care not to handle the CRT by the neck].

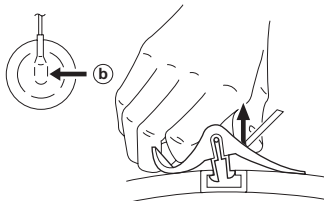
ANODE CAP REMOVAL PROCEDURE

WARNING: High voltage remains in the CRT even after the power is disconnected. To avoid electric shock, discharge CRT before attempting to remove the anode cap. After removing the anode cap, short circuit to either the metal chassis, CRT shield, or carbon painted on the CRT.

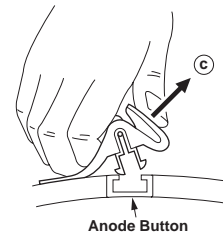
REMOVAL PROCEDURES



Turn up one side of the rubber cap in the direction indicated by arrow a .



Use your thumb to pull the rubber cap firmly in the direction indicated by arrow b .



When one side of the rubber cap separates from the anode button, the anode cap can be removed by turning the rubber cap and pulling it in the direction of arrow c .

HOW TO HANDLE AN ANODE CAP

1. Do not use sharp objects which may cause damage to the surface of the anode cap.
2. To avoid damaging the anode cap, do not squeeze the rubber covering too hard. A material fitting called a shatter-hook terminal is built into the rubber.
3. Do not force turn the foot of the rubber cover. This may cause the shatter-hook terminal to protrude and damage the rubber.



SECTION 2: SET-UP ADJUSTMENTS

The following adjustments should be made when a complete realignment is required or a new picture tube is installed. These adjustments should be performed with rated power supply voltage unless otherwise noted.

The controls and switch should be set as follows unless otherwise noted:

PICTURE CONTROL: normal
BRIGHTNESS CONTROL: normal

Perform the adjustments in order as follows:

1. Beam Landing
2. Convergence
3. Focus
4. Screen (G2)/White Balance

Test Equipment Required:

1. Color Bar Pattern Generator
2. Degausser
3. DC Power Supply
4. Digital Multimeter

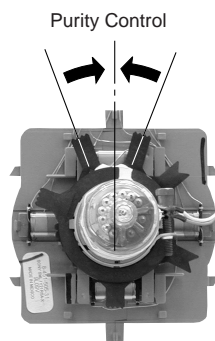
2-1. BEAM LANDING

Preparation:

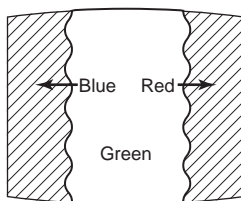
- Degauss the entire screen.
- Feed in the white pattern signal.

Adjustment Procedure

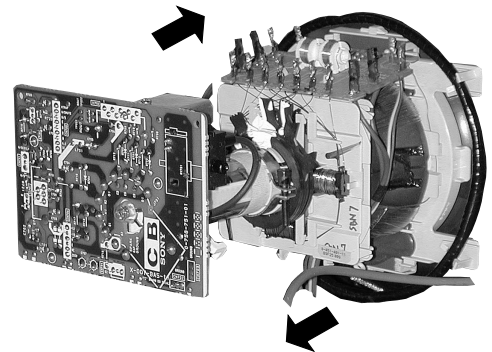
1. Input a raster signal with the pattern generator.
2. Loosen the deflection yoke mounting screw, and set the purity control to the center as shown below:



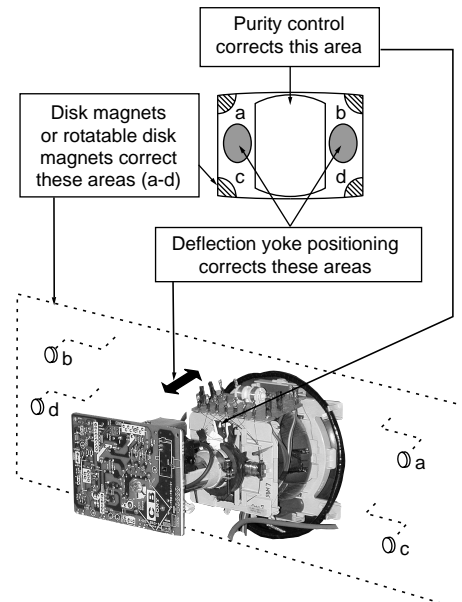
3. Turn the raster signal of the pattern generator to green.
4. Move the deflection yoke backward, and adjust with the purity control so that green is in the center and red and blue are even on both sides.



5. Move the deflection yoke forward, and adjust so that the entire screen becomes green.



6. Switch over the raster signal to red and blue and confirm the condition.
7. When the position of the deflection yoke is determined, tighten it with the deflection yoke mounting screw.
8. When landing at the corner is not right, adjust by using the disk magnets.



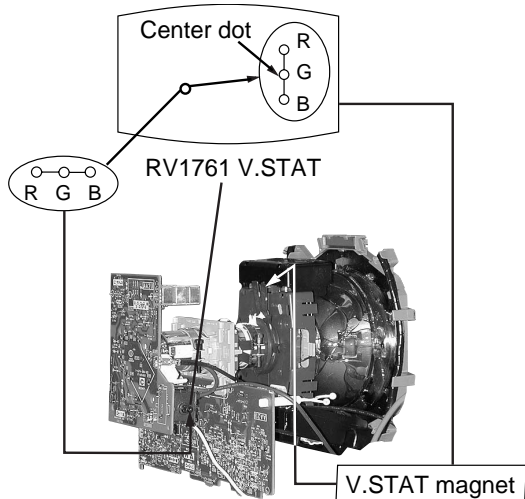
2-2. CONVERGENCE

Preparation:

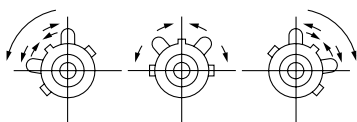
- Perform FOCUS, V. LIN and V. SIZE adjustments.
- Set BRIGHTNESS control to minimum.
- Input dot pattern.

VERTICAL STATIC CONVERGENCE

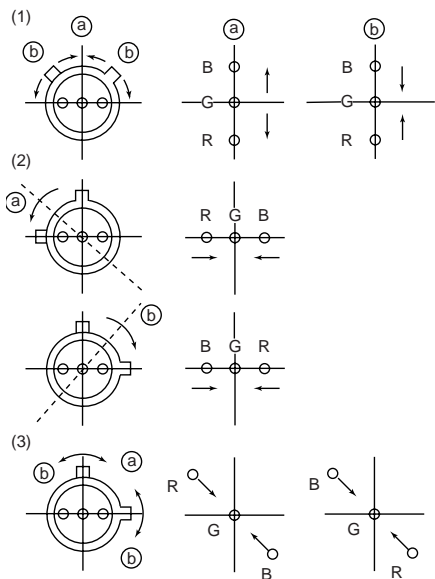
1. Adjust V. STAT magnet to converge red, green and blue dots in the center of the screen (Vertical movement).



Tilt the V. STAT magnet and adjust static convergence to open or close the V. STAT magnet.



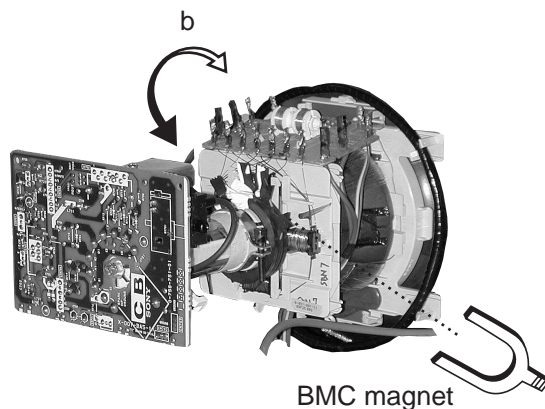
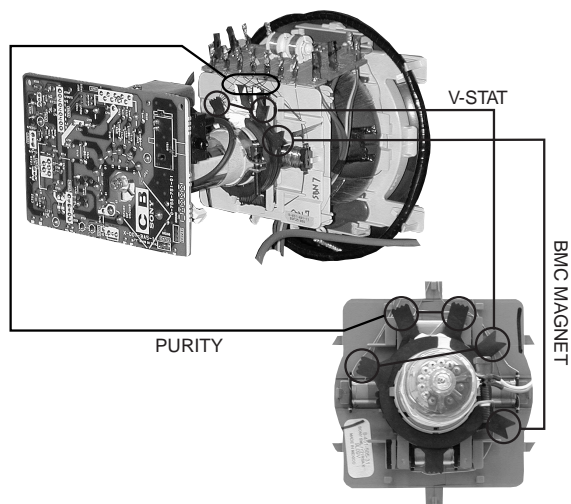
2. When the V. STAT magnet is moved in the direction of arrow a and b, red, green, and blue dots move as shown below:



HORIZONTAL STATIC CONVERGENCE

If the blue dot does not converge with the red and green dots, perform the following:

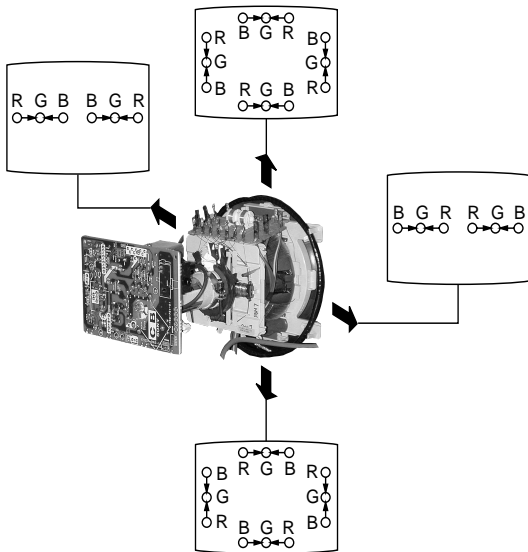
1. Move BMC magnet (a) to correct insufficient H. Static convergence.
2. Rotate BMC magnet (b) to correct insufficient V. Static convergence.
3. After adjusting the BMC magnet, repeat Beam Landing Adjustment.



DYNAMIC CONVERGENCE ADJUSTMENT

Before starting, perform Vertical and Horizontal Static Convergence Adjustment.

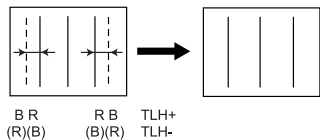
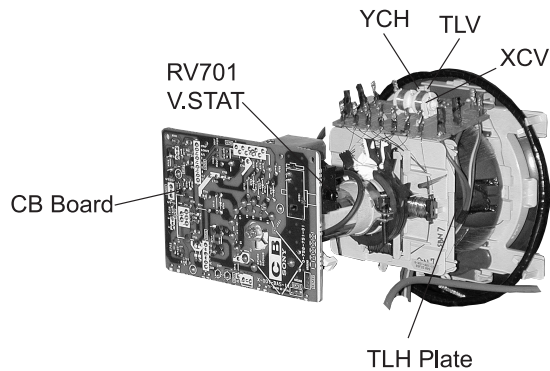
1. Slightly loosen deflection yoke screw.
2. Remove deflection yoke spacers.
3. Move the deflection yoke for best convergence as shown below:



4. Tighten the deflection yoke screw.
5. Install the deflection yoke spacers.

TLH PLATE ADJUSTMENT

1. Input crosshatch pattern.
2. Adjust PICTURE QUALITY to standard, PICTURE and BRIGHTNESS to 50%, and OTHER to standard.
3. Adjust the Horizontal Convergence of red and blue dots by tilting the TLH plate on the deflection yoke.

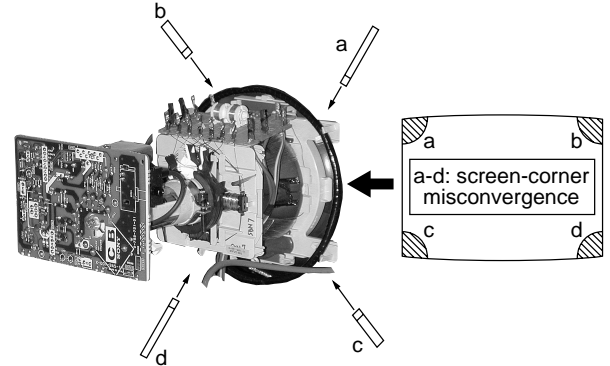


4. Adjust XCV core to balance X axis.

5. Adjust YCH VR to balance Y axis.
6. Adjust vertical red and blue convergence with V.TILT (TLV VR). Perform adjustments while tracking items 1 and 2.

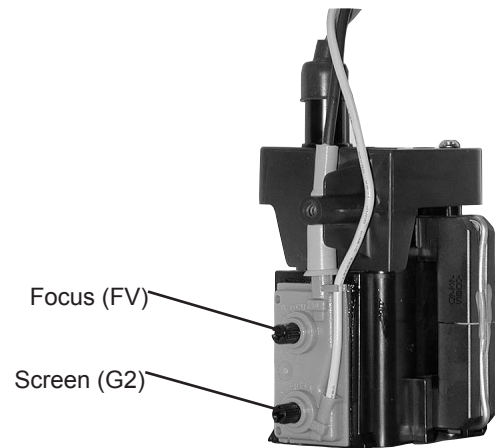
SCREEN-CORNER CONVERGENCE

1. Affix a permalloy assembly corresponding to the misconverged areas.



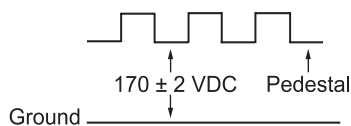
2-3. FOCUS

1. Adjust FOCUS control for best picture.



2-4. SCREEN (G2)

1. Input a dot pattern.
2. Set the PICTURE and BRIGHTNESS controls at minimum and COLOR control at normal.
3. Adjust SBRT, GCUT, BCUT in service mode with an oscilloscope as shown below so that voltages on the red, green, and blue cathodes are 170 ± 2 VDC.



4. Observe the screen and adjust SCREEN (G2) VR in FBT to obtain the faintly visible background of dot signal.

2-5. METHOD OF SETTING THE SERVICE ADJUSTMENT MODE

Service Mode Procedure

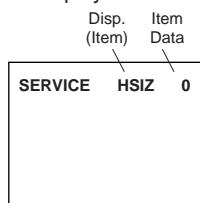
1. Standby mode (power off).
2. On the remote commander, press:

Display → **Channel 5** → **Sound Volume +** → **Power**

(press each button within a second).

Service Adjustment Mode In

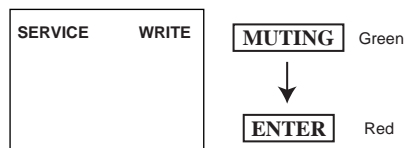
1. The CRT displays the item being adjusted.



2. Press **1** or **4** on the Remote Commander to select the item.
3. Press **3** or **6** on the Remote Commander to change the data.
4. Press MUTING then ENTER to save into the memory.

Service Adjustment Mode Memory

Turn set off then on to exit service adjustment mode.






2-6. WHITE BALANCE ADJUSTMENTS

1. Input an entire white signal with burst.
2. Set to Service Adjustment Mode.
3. Set DCOL to "0".
4. Set the PICTURE and BRIGHTNESS to minimum.
5. Adjust with SBRT if necessary.
6. Select GCUT and BCUT with **1** and **4**.
7. Adjust with **3** and **6** for the best white balance.
8. Set PICTURE and BRIGHTNESS to maximum.
9. Select GDRV and BDRV with **1** and **4**.
10. Adjust with **3** and **6** for the best white balance.
11. Reset DCOL to "1".
12. To write into memory, press MUTING then ENTER.

SECTION 3: SAFETY RELATED ADJUSTMENTS

3-1. R564 CONFIRMATION METHOD (HV HOLD-DOWN CONFIRMATION AND READJUSTMENTS)

The following adjustments should always be performed when replacing the following components which are marked with  on the schematic diagram:

Part Replaced ()	Adjustment ()
DY, T505, CRT, IC501, C507, C520, C505, C509, C515, L509, L508, C551, L510, C546, C537, C547, D517, D518, D519, R560, R561, R562, R563, R565, R566, R567, R525.....A Board	HV HOLD-DOWN R564
IC1301.....MB Board	


Preparation Before Confirmation

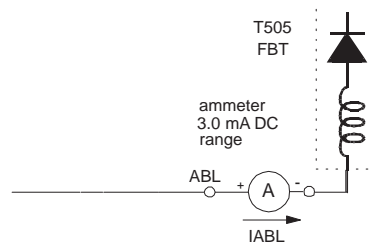
- Using a Variac, apply AC input voltage: 120 ± 2 VAC.
- Turn the POWER switch ON.
- Input a white signal and set the PICTURE and BRIGHTNESS controls to maximum.
- Confirm that the voltage between C546 (+) or TP503 and ground is more than 100 VDC.

Hold-Down Operation Confirmation


- Connect the current meter between Pin 11 of the FBT (T505) and the PWB land where Pin 11 would normally attach. (See Figure 1 on the next page.)
- Input a dot signal and set PICTURE and BRIGHTNESS to minimum: IABL = 100 ± 100 μ A.
- Confirm the voltage of A Board TP600 is 135 ± 1 VDC.
- Connect the digital voltmeter and the DC power supply via diode 1SS119 to C546 (+) and ground. (See Figure 1 on the next page.)
- Increase the DC power voltage gradually until the picture blanks out.
- Turn DC power source off immediately.
- Read the digital voltmeter indication (standard < 120 ± 0.3 VDC).
- Input a white signal and set PICTURE and BRIGHTNESS to maximum: IABL = 820 ± 100 μ A.
- Repeat steps 4 to 7.

Hold-Down Readjustment

If the setting indicated in step 2 of Hold-Down Operation Confirmation cannot be met, readjustment should be performed by altering the resistance value of R564 component marked with .



3-2. B+ VOLTAGE CONFIRMATION AND ADJUSTMENT

Note: The following adjustments should always be performed when replacing the following components, which are marked with  on the schematic diagram on the A Board.

A BOARD:	IC601, PH601
-----------------	--------------

- Using a Variac, apply AC input voltage: $130 + 2.0/-0.0$ VAC.
- Input a dot signal.
- Set the PICTURE and BRIGHTNESS controls to minimum.
- Confirm that the voltage of A Board TP600 is <136 VDC.
- If step 4 is not satisfied, replace the components listed above, then repeat steps 1–3.

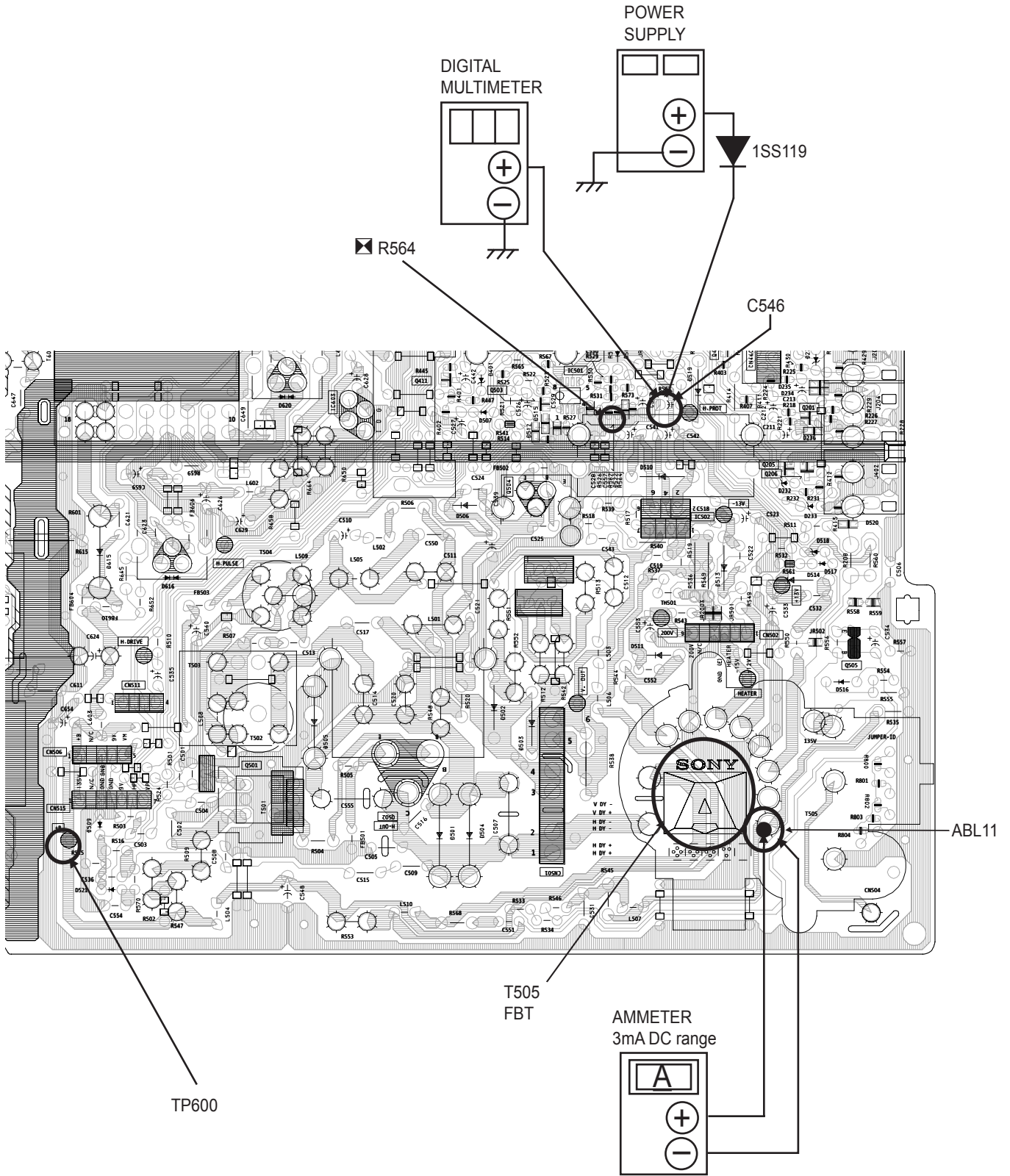


Figure 1

SECTION 4: CIRCUIT ADJUSTMENTS

ELECTRICAL ADJUSTMENTS BY REMOTE COMMANDER

Use the Remote Commander (RM-Y172) to perform the circuit adjustments in this section.

Test Equipment Required: 1. Pattern generator 2. Frequency counter 3. Digital multimeter 4. Audio oscillator

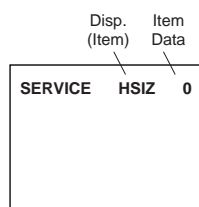
4-1. SETTING THE SERVICE ADJUSTMENT MODE

- Standby mode (power off).
- On the remote commander, press the following within one second of each other:

Display → Channel 5 → Sound Volume + → Power

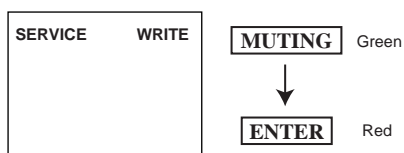
Service Adjustment Mode On

- The CRT displays the item being adjusted.

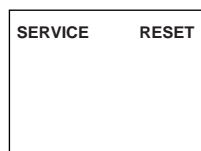


- Press 1 or 4 on the Remote Commander to select an item.
- Press 3 or 6 on the Remote Commander to change the data.
- Press MUTING then ENTER to save into the memory.

Service Adjustment Mode Memory



- Press 8 then ENTER on the Remote Commander to initialize.



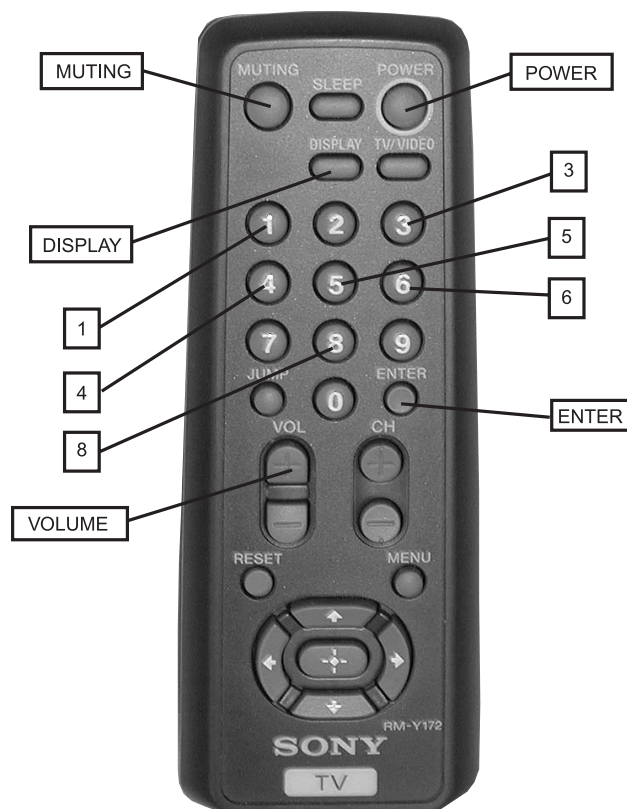
Carry out step 1 when adjusting IDs 0-4 and when replacing and adjusting IC1003.

- Turn set off then on to exit service adjustment mode.

4-2. MEMORY WRITE CONFIRMATION METHOD

- After adjustment, remove the power plug from the AC outlet, then plug it in again.
- Turn the power switch ON and set to service mode.
- Call the adjusted items again to confirm they were adjusted.

4-3. ADJUSTMENT BUTTONS AND INDICATORS



RM-Y172

ADJUSTMENT ITEMS (1 OF 2)

Reg #	ITEM	FUNCTION	RANGE	FIX DATA	NTSC	PAL M	PAL N	VIDEO	RF	AVERAGE DATA		
1	HSIZ	Horizontal Size Adjustment	0-63	35	35	35	35			31		
2	HPOS	Horizontal Position Adjustment	0-63	20	33	33	33			17		
3	VBOW	Vertical Line Bowing Adj.	0-15	7	5	5	5			7		
4	VANG	Vertical Line Bowing Slant Adj.	0-15	7	7	7	7			8		
5	TRAP	Horizontal Trapezoid Adj.	0-15	7	7	7	7			6		
6	PAMP	Horizontal PIN distortion Adj.	0-63	20	7	7	7			15		
7	UPIN	Upper PIN Distortion Adj.	0-63	31	36	36	36			28		
8	LPIN	Lower PIN Distortion Adj.	0-63	31	36	36	36			34		
9	VM	Velocity Modulation on/off	0,1	Palette mode controls this register								0
10	BLKO	Vertical Blanking on/ff	0,1	0						0		
11	VMLV	Velocity Modulation Level	0-3	Palette mode controls this register								0
12	AGN2	Aging 2	0,1	0						0		
13	REFP	Reference Pulse position	0,1	0						0		
14	VBLK	Vertical Blanking on/off	0,3	0						0		
15	JPSW		0,1	0						0		
16	VSIZ	Vertical Size Adjustment	0-63	31	47	47	47			23		
17	VPOS	Vertical Position Adj.	0-63	31	32	32	32			32		
18	VLIN	Vertical linearity Adj.	0-15	7						5		
19	SCOR	Vertical "S" Correction Adjustment	0-15	6						4		
20	VZOM	16:9 CRT Z Mode on/off	0,1	0						0		
21	EHT	Vertical High-Voltage Compensation	0-15	8						10		
22	ASP	Aspect Ratio control	0-63	47						47		
23	SCRL	16:9 CRT Z Mode Trans. Scroll	0-63	31						31		
24	HBLK	Horizontal Blanking on/off	0,1	1						1		
25	LBLK	Left Blanking Adjustment	0-15	11						11		
26	RBLK	Right Blanking Adjustment	0-15	8						8		
27	VUSN	V Saw Waveform Compress	0,1	0						0		
28	HDW	Horizontal Drive Pulse Width	0,1	1						1		
29	EWDC	"Parabola" EW, D.C. Adjustment	0,1	0						0		
30	LVLN	Lower Screen BTM Vertical Line Adj.	0-15	0						0		
31	UVLN	Upper Screen BTM Vertical Line Adj.	0-15	0						0		
32	HTRP	Horiz. Trapezoid	0-1	0						0		
33	RDRV	R Output Drive control	0-63	31						21		
34	GDRV	G Output Drive control	0-63	21						14		
35	BDRV	B Output Drive control	0-63	21						14		
36	RCUT	R Output Cutoff control	0-15	10						10		
37	GCUT	G Output Cutoff control	0-15	6						7		
38	BCUT	B Output Cutoff control	0-15	6						7		
39	DCOL	Dynamic Color on/off	0,1	0						1		
40	SHUE	Sub HUE adjustment	0-31	12						14		
41	SCOL	Sub COLOR adjustment	0-31		14	14	14			14		
42	SBRT	Sub BRIGHTNESS adjustment	0-31	13						13		
43	RON	R Output on/off	0,1	1						1		
44	GON	G Output on/off	0,1	1						1		
45	BON	B Output on/off	0,1	1						1		
46	AXPL	Axis PAL	0,1	0						0		
47	AXNT	Axis NTSC	0,1	0						1		
48	CBPF	Chroma BPF on/off	0,1	1						1		
49	CTRP	Y TRAP FILTER on/off	0,1	1						1		
50	COFF	Color On/off	0,1	0						0		
51	KOFF	Set Color Killer	0,1	0						0		
52	SSH P	Sub SHARPNESS	0-15	5						5		
53	SHPF	SHARPNESS Circuit Focus	0,1	Palette mode controls this register								1
54	PREL	Pre-Shoot/ Over-Shoot	0,1	1						1		
55	Y-DC	DC Transmission Ratio Switching	0,1	Palette mode controls this register								1
56	GAMM	Gamma Correction	0-3	Palette mode controls this register								1
57	ABLM	ABL Mode Switch	0,1	1						1		
58	VTH	ABL CD VHT Switching	0,1	1						1		
59	YDEL	Y Delay Time Control	0-15	7						7		
60	NCOL	No Color ID	0,1	1						1		
61	FSC	FSC Out on/off	0,1	1						1		
62	K-ID	Killer ID Control on/off	0,1	0						0		
63	HOSC	Horizontal VCO Oscillation Freq.	0-15	10						7		

ADJUSTMENT ITEMS (2 OF 2)

Reg #	ITEM	FUNCTION	RANGE	FIX DATA	NTSC	PAL M	PAL N	VIDEO	AVERAGE DATA
64	VSS	Vertical Sync Slice Level	0,1	1					0
65	HSS	Horizontal Sync Slice Level	0,1	0					0
66	HMSK	For Macro Vision	0,1	0					0
67	VTMS	Select Signal VTIM Pin	0-3	0					0
68	CDMD	Vertical Count Down Mode Switching	0-3	3				3	
69	AFC	AFC Loop Gain Switching	0-3	0				0	0
70	FIFR	Field Frequency	0-3		3	1	1		3
71	SBAL	Sub Balance	0-15	5					7
72	SBAS	Sub Bass	0-7	0					9
73	STRE	Sub Treble	0-7	3					9
74	BBEH	BBE High	0-15	6					
75	BBEL	BBE Low	0-15	8					12
76	SRND	Surround	0,1	0					13
77	AUX	SRS, Simulated	0,3	0					
78	DISP	O.S.D Display position	0-130	26					15
79	TROT	Tilt Correction	0-63	31					31
80	HCLW	Horizontal Count lower limit	0-255	16					16
81	HCHG	Horizontal Count High limit	0-255	64					64
106	SYSC	Color System	0-7	4					6
107	VENH	Vertical Enhancement	0-7	Palette mode controls this register					4
108	PDSO		0,1	0					
109	CK		0,1	0					
110	VNL		0,15	3					3
111	HPK		0,1	0					0
112	HPK0		0,1	Palette mode controls this register					
113	CORE		0,3	1					1
114	TRAP		0,1	1					1
115	CHTR		0,1	0					0
116	CHPF		0,1	1					1
117	ENHO		0,1	0					0
118	ID0		0,255						89
119	ID1		0,255						3
120	ID2		0,255						72
121	ID3		0,255						16
122	ID4		0,255						137
123	ID5		0,255						1
124	ID6		0,255						0

Notes:

No. 1–100 show the order that each adjustment mode may be selected while in service mode.

Data Range shows the range of possible settings for each adjustment mode.

Initial Data shows the standard settings for each adjustment mode.

SERVICE	ID0	25
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4-4. MB BOARD ADJUSTMENTS

H. FREQUENCY (FREE RUN) CHECK

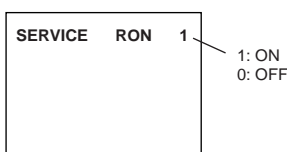
1. Input a TV mode (RF) with no signal.
2. Connect a frequency counter to base of Q501 (TP500 H. DRIVE).
3. Check H. Frequency for 15735 ± 200 Hz for NTSC.

V. FREQUENCY (FREE RUN) CHECK

1. Select video 1 with no signal input.
2. Set the conditions for a standard setting.
3. Connect the frequency counter on the A Board to TP508 (V OUT) or CN501 pin 6 (V DY+) and ground.
4. Check that V. Frequency shows 60 ± 4 Hz for NTSC.

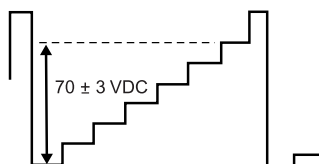
DRIVE (RDRV)

1. Input a color-bar signal and set the level to 75%.
2. In Standard mode, set PICTURE to maximum and COLOR to minimum.
3. Activate the Service Adjustment Mode.
4. Set both GON and BON items. Using **3** and **6**; set each to the following values. Leave RON set to "1".



R ON: ON (1)
G ON: OFF (0)
B ON: OFF (0)

5. Select the DCOL item and set it to "0".
6. Connect an oscilloscope probe to CB board, J701 pin 11, KR (RED OUT).
7. Select RDRV with **1** and **4**.
8. Adjust the value of RDRV with **3** and **6** for 70 ± 3 VDC.



9. Reset the item DCOL to "1".
10. Reset GON and BON values to "1".

R ON: ON (1)
G ON: ON (1)
B ON: ON (1)

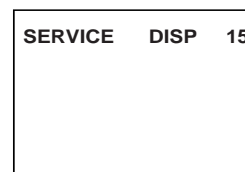
11. Reset Picture and Color to normal values:

PICTURE: MAX
COLOR: CENTER

12. Press MUTING, then ENTER to save into the memory.

DISPLAY POSITION ADJUSTMENT (DISP)

1. Input a color-bar signal.
2. Set to Service Adjustment Mode.
3. Select DISP with **1** and **4**.
4. Adjust values of DISP with **3** and **6** to adjust characters to the center.
5. Write to memory by pressing MUTING, then ENTER.
6. Check to see if the text is displayed on the screen.

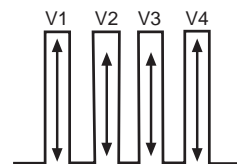


SUB BRIGHT ADJUSTMENT (SBRT)

1. Input a monoscope signal.
2. Activate the Service Adjustment Mode.
3. Set the PICTURE and BRIGHTNESS to minimum.
4. Select the SBRT item with **1** and **4**.
5. Adjust the values of SBRT with **3** and **6** to obtain a faintly visible crosshatch.
6. Press MUTING then ENTER to save into the memory.

SUB HUE, SUB COLOR ADJUSTMENT (SHUE, SCOL)

1. Input a color-bar signal.
2. Activate the Service Adjustment Mode.
3. Select the DCOL item and set the value to "0".
4. Connect an oscilloscope probe to CB board, CN705 Pin 4 (Blue Out).
5. Select the SHUE and SCOL item with **1** and **4**.
6. While showing the SHUE item, adjust the waveform with **3** and **6** until the second and third bars show the same level ($V2 = V3 < 0.1$ Vp-p).
7. While showing the SCOL item, adjust the waveform with **3** and **6** until the first and fourth bars show the same level ($V1 = V4 < 0.1$ Vp-p).

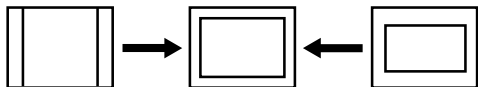


8. Select the DCOL item and reset to 1.
9. Press MUTING and ENTER to save into the memory.

V. SIZE ADJUSTMENT (VSIZ)

1. Input a crosshatch signal.
2. Activate the Service Adjustment Mode.
3. Select the VSIZ item with **1** and **4**.
4. Adjust value of VPOS with **3** and **6** for the best vertical center.

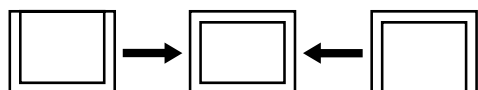
- Press MUTING then ENTER to save into the memory.



V. CENTER ADJUSTMENT (VPOS)

Perform this adjustment after performing H. Frequency (Free Run) Check.

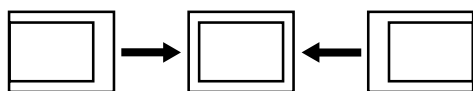
- Input a crosshatch signal.
- Activate the Service Adjustment Mode.
- Select the VPOS item with **1** and **4**.
- Adjust value of VPOS with **3** and **6** for the best vertical center.
- Press MUTING then ENTER to save into the memory.



H. CENTER ADJUSTMENT (HPOS)

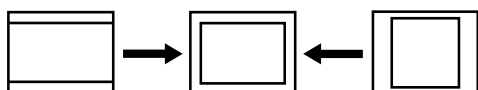
Perform this adjustment after performing H. Frequency (Free Run) Check.

- Input a crosshatch signal.
- Activate the Service Adjustment Mode.
- Select the HPOS item with **1** and **4**.
- Adjust the value of HPOS with **3** and **6** for the best horizontal center.
- Press MUTING and ENTER to save into the memory.



H. SIZE ADJUSTMENT (HSIZ)

- Input a monoscope signal.
- Activate the Service Adjustment Mode.
- Select HSIZ with **1** and **4**.
- Adjust with **3** and **6** for the best horizontal size.
- Press MUTING and ENTER to save into the memory.

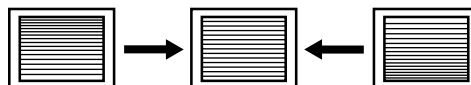


V. LINEARITY (VLIN), V. CORRECTION (VSCO), PIN AMP (PAMP), AND HORIZONTAL TRAPEZOID (TRAP) ADJUSTMENTS

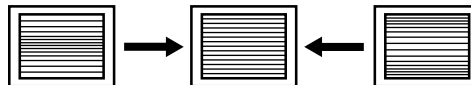
- Input a crosshatch signal.
- Activate the Service Adjustment Mode.
- Select VLIN, VSCO, PAMP, and PPHA with **1** and **4**.
- Adjust with **3** and **6** for the best horizontal size.

- Press MUTING then ENTER to save into the memory.

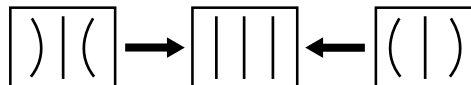
V LINEARITY (VLIN)



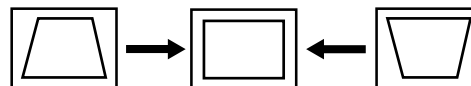
V CORRECTION (VSCO)



PIN AMP (PAMP)



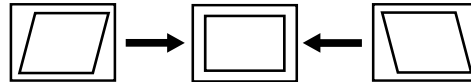
HORIZONTAL TRAPEZOID (TRAP)



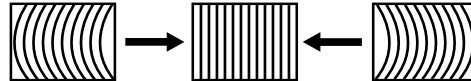
V. ANGLE (VANG), V. BOW (VBOW), UPPER PIN (UPIN) AND LOW PIN (LPIN) ADJUSTMENTS

- Input a crosshatch signal.
- Activate the Service Adjustment Mode.
- Select VANG, VBOW, UPIN, and LPIN with **1** and **4**.
- Adjust with **3** and **6** for the best picture.
- Press MUTING and ENTER to save into the memory.

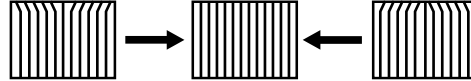
V ANGLE (VANG)



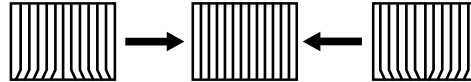
V BOW (VBOW)



UPPER PIN (UPIN)



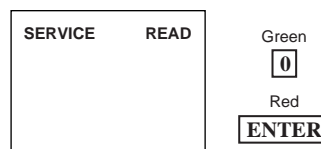
LOW PIN (LPIN)



SERVICE ADJUSTMENT MODE MEMORY

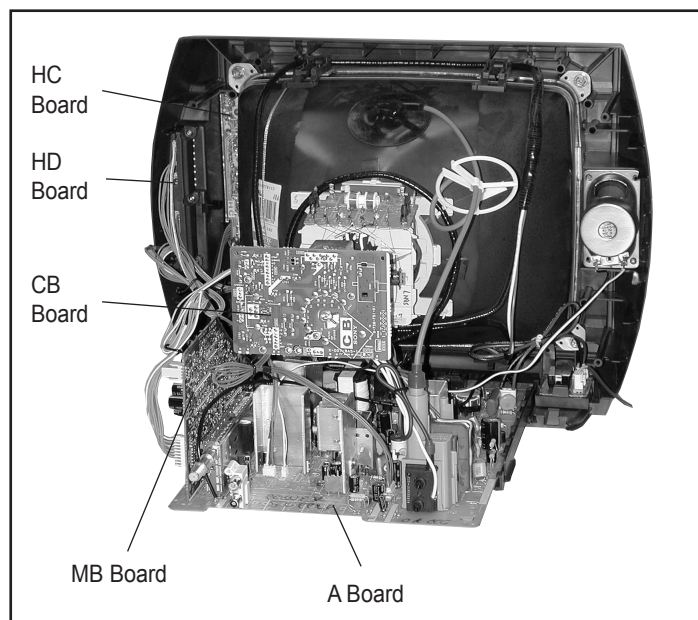
- Change the value of the DCOL item to "1".
- After completing all adjustments, press **0** then ENTER.

Read From Memory



SECTION 5: DIAGRAMS

5-1. CIRCUIT BOARDS LOCATION



5-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS INFORMATION

All capacitors are in μF unless otherwise noted. pF : μF 50WV or less are not indicated except for electrolytics and tantalums.

All electrolytics are in 50V unless otherwise specified.

All resistors are in ohms. $\text{K}\Omega=1000\Omega$, $\text{M}\Omega=1000\text{k}\Omega$

Indication of resistance, which does not have one for rating electrical power, is as follows: Pitch : 5mm

Rating electrical power : $\frac{1}{4}$ W

$\frac{1}{4}$ W in resistance, $\frac{1}{10}$ W and $\frac{1}{8}$ W in chip resistance.

: nonflammable resistor.

: fusible resistor.

Δ : internal component.

: panel designation and adjustment for repair.

All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

Readings are taken with a color-bar signal input.

Readings are taken with a 10M Ω digital multimeter.

Voltages are DC with respect to ground unless otherwise noted.

Voltage variations may be noted due to normal production tolerances.

All voltages are in V.

S : Measurement impossibility.

: B+line.

: B-line. (Actual measured value may be different).

: signal path. (RF)

Circled numbers are waveform references.

The components identified by shading and Δ symbol are critical for safety. Replace only with part number specified.

The symbol indicates a fast operating fuse and is displayed on the component side of the board. Replace only with fuse of the same rating as marked.

Les composants identifiés par un trame et une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Le symbole indique une fusible à action rapide. Doit être remplacé par une fusible de même valeur, comme marqué.

The components identified by in this basic schematic diagram have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be necessary, replace only with the value originally used.

When replacing components identified by , make the necessary adjustments as indicated. If the results do not meet the specified value, change the component identified by and repeat the adjustment until the specified value is achieved.

(Refer to R564 Adjustment on page 15.)

When replacing the parts listed in the table below, it is important to perform the related adjustments.

Part Replaced ()	Adjustment ()
DY, T505, CRT, IC501, C507, C520, C505, C509, C515, L509, L508, C551, L510, C546, C537, C547, D517, D518, D519, R560, R561, R562, R563, R565, R566, R567, R525.....A Board	HV HOLD-DOWN R564
IC1301.....MB Board	

REFERENCE INFORMATION

RESISTOR

: RN METAL FILM

: RC SOLID

: FPRD NONFLAMMABLE CARBON

: FUSE NONFLAMMABLE FUSIBLE

: RW NONFLAMMABLE WIREWOUND

: RS NONFLAMMABLE METAL OXIDE

: RB NONFLAMMABLE CEMENT

: ADJUSTMENT RESISTOR

COIL

: LF-8L MICRO INDUCTOR

CAPACITOR

: TA TANTALUM

: PS STYROL

: PP POLYPROPYLENE

: PT MYLAR

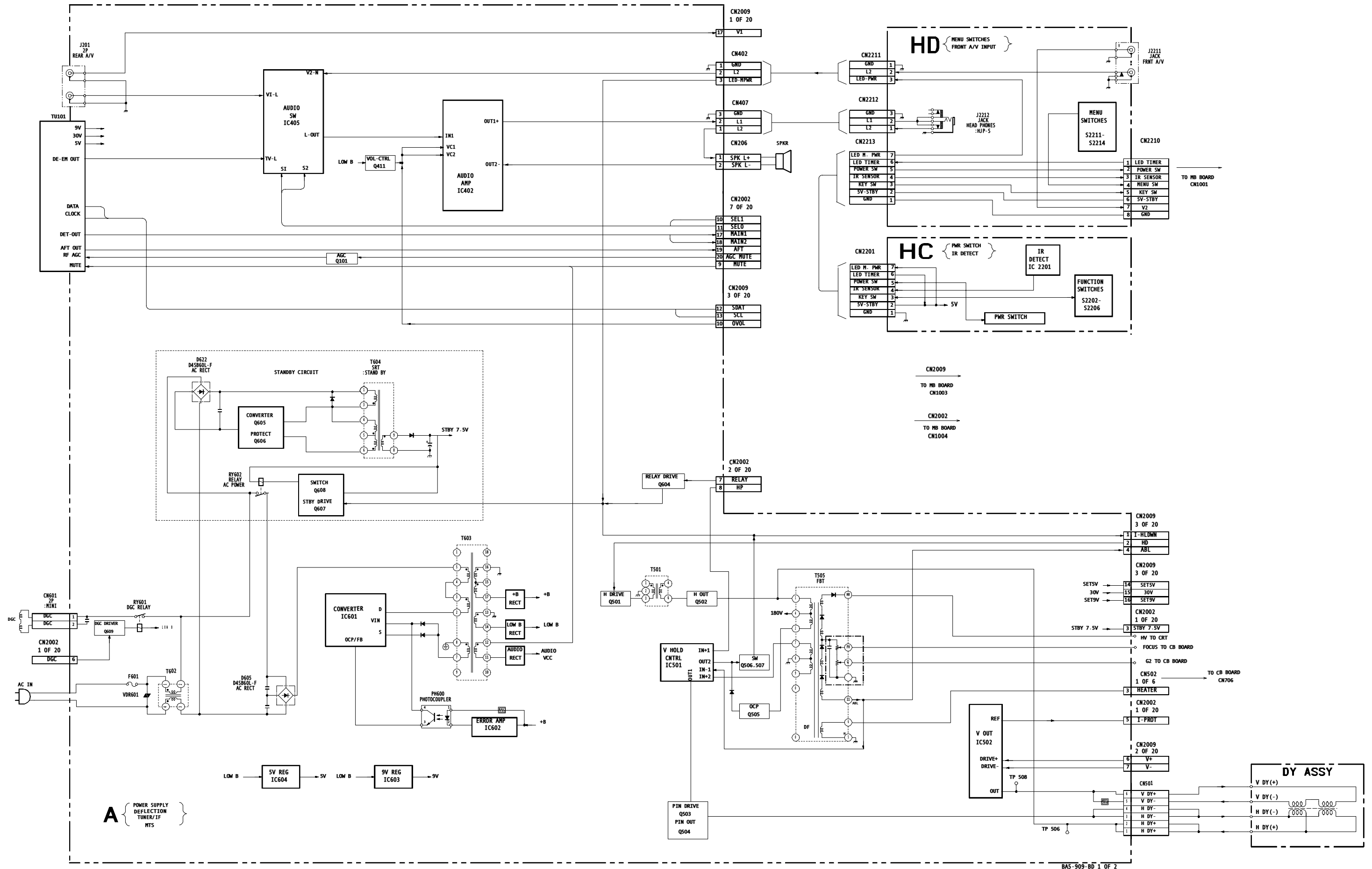
: MPS METALIZED POLYESTER

: MPP METALIZED POLYPROPYLENE

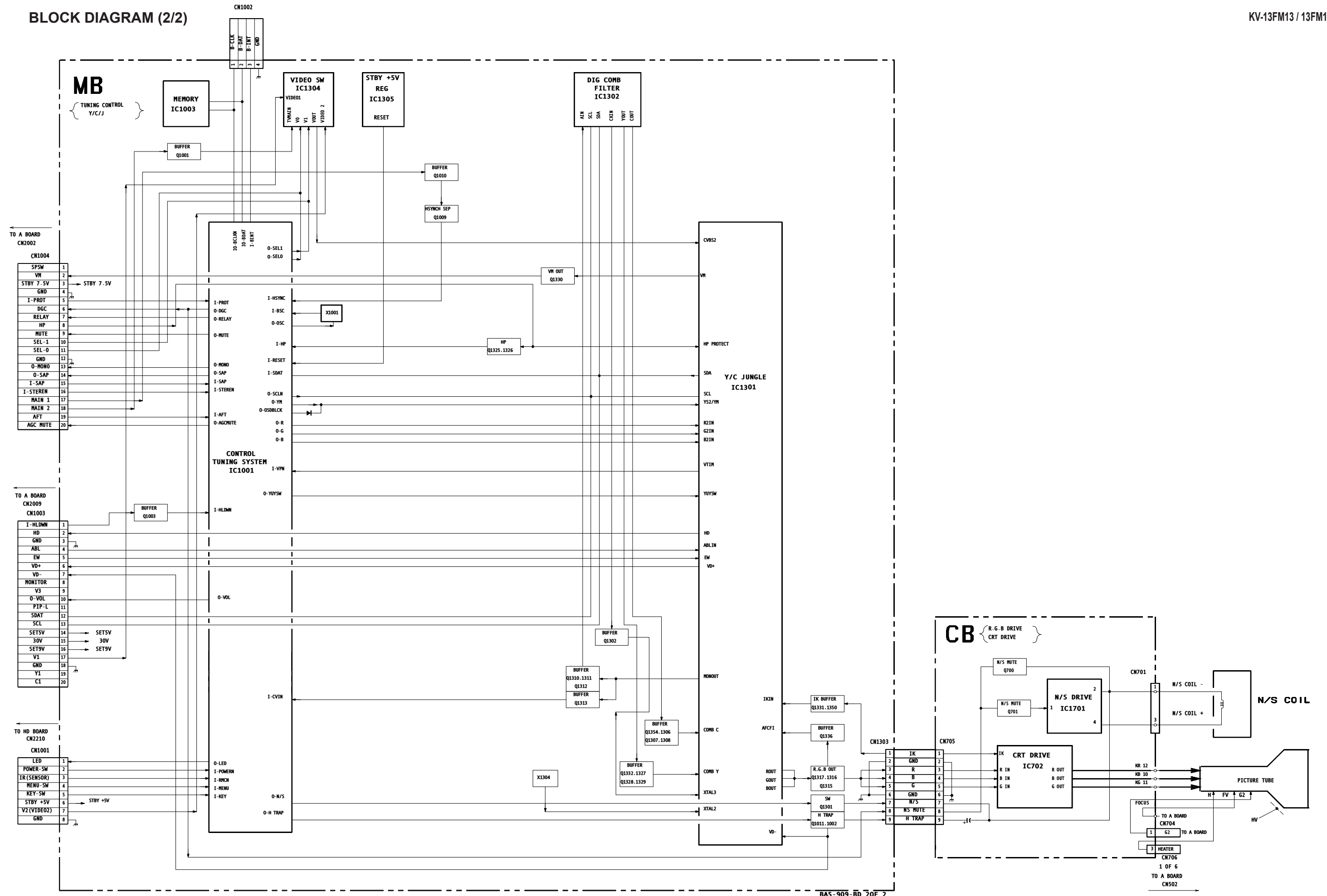
: ALB BIPOLAR

: ALT HIGH TEMPERATURE

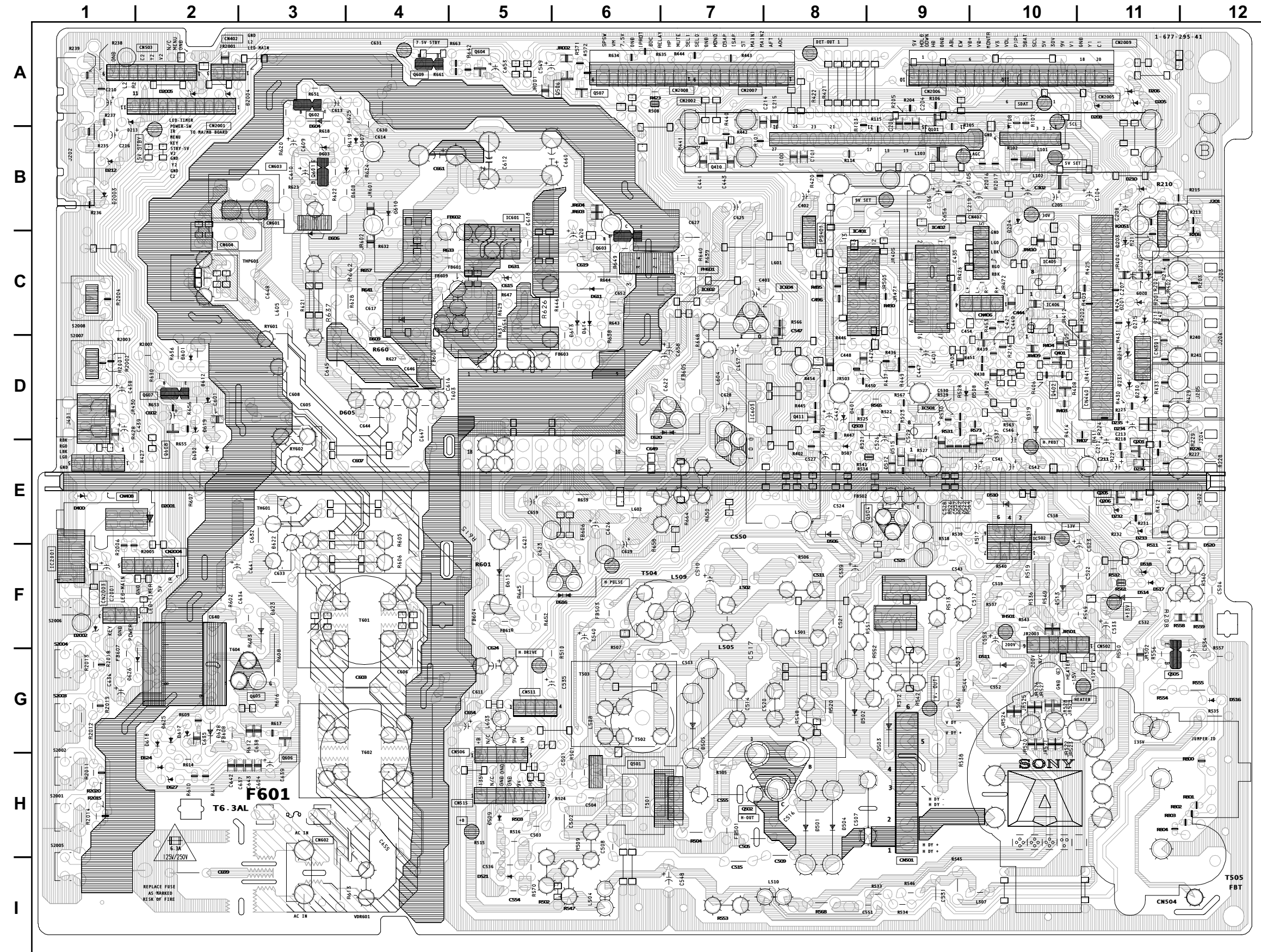
: ALR HIGH RIPPLE



BAS-905-BD 1 OF 2



A [POWER SUPPLY, DEFLECTION, TUNER/IF, AUDIO, MTS]

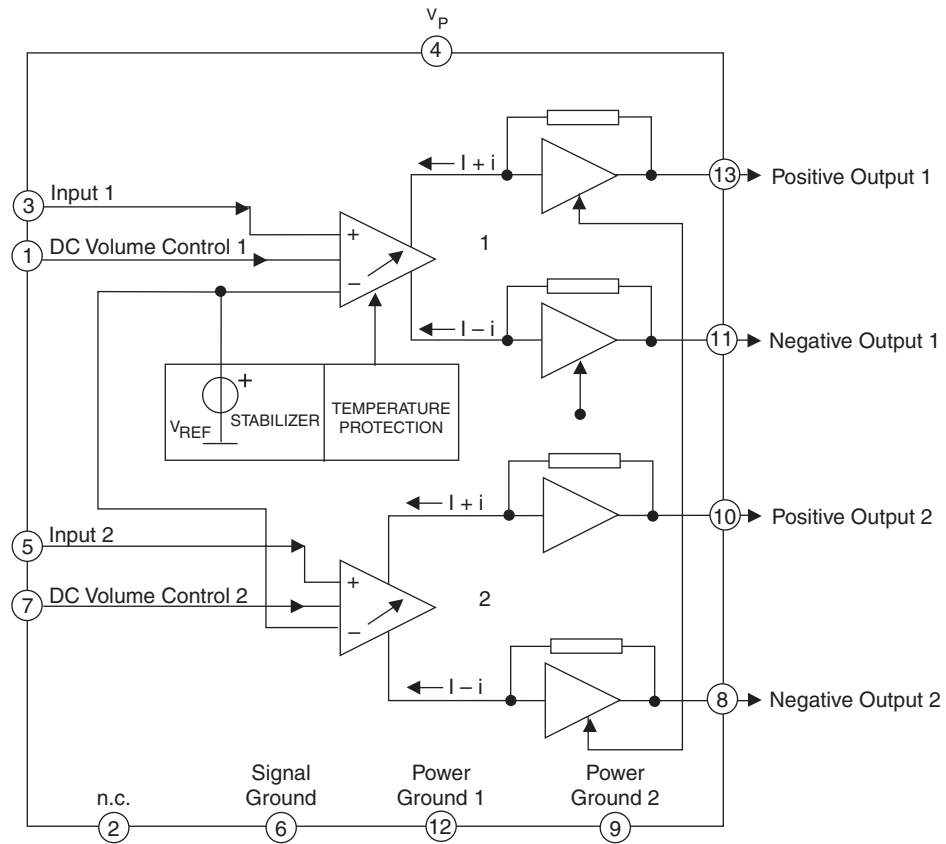


A BOARD LOCATOR LIST

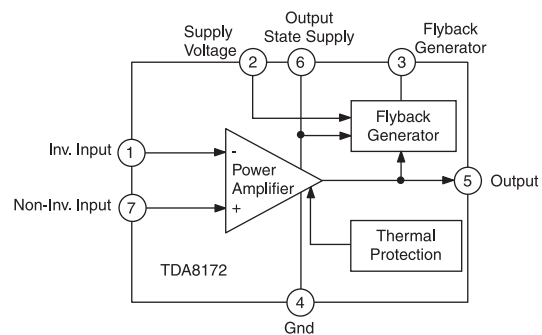
DIODE	D620	E-7	
D204	C-10	D622	F-3
D208	B-11	D623	F-3
D209	B-11	D624	H-2
D210	B-11	D625	G-2
D400	E-1	D626	G-2
D401	E-8	D627	H-2
D502	G-9	D628	G-2
D503	G-9	D2002	F-1
D504	H-9	D2004	A-3
D505	G-7	D2005	A-2
D506	E-8		IC
D507	E-8	IC401	C-9
D508	E-10	IC405	C-10
D509	H-5	IC501	D-9
D510	E-10	IC502	F-10
D511	G-10	IC601	B-5
D513	F-10	IC602	C-7
D514	F-11	IC603	E-7
D516	G-12	IC604	C-8
D517	F-11	TRANSISTOR	
D518	F-11	Q101	B-9
D519	E-10	Q411	D-8
D520	F-12	Q501	H-6
D601	D-2	Q502	H-7
D602	E-2	Q503	D-8
D605	D-4	Q504	E-9
D610	C-4	Q505	G-11
D611	C-6	Q506	A-6
D612	C-2	Q507	A-6
D613	D-6	Q604	A-5
D614	D-6	Q605	G-3
D615	F-5	Q606	G-3
D616	F-6	Q607	D-2
D617	G-2	Q608	E-2
D618	G-2	Q609	A-4
D619	D-2		

A BOARD IC BLOCK DIAGRAMS

A BOARD: IC401 TDA7057AQ/N2



A BOARD: IC502 TDA8172



A BOARD IC VOLTAGE LIST

IC401		9	0.0	4	0.1	4	GND	4	-13.9	5	-32.7	3	GND
pin	volt	10	6.9	5	6.1	5	9.5	5	0.2	IC602		4	13.3
1	0.6	11	6.9	6	9.0	6	10.1	6	14.3	pin	volt	IC604	
2	0.0	12	0.0	7	5.3	7	0.1	7	2.1	1	135.9	pin	volt
3	2.4	13	6.9	8	GND	8	14.0	IC601		2	123.4	1	13.3
4	14.3	IC405		IC501		IC502		pin	volt	3	GND	2	5.0
5	2.4	pin	volt	pin	volt	pin	volt	1	-31.8	IC603		3	GND
6	0.0	1	6.0	1	0.2	1	2.1	2	-32.7	pin	volt		
7	0.6	2	0.1	2	3.7	2	14.0	3	53.2	1	13.3		
8	6.9	3	6.1	3	2.5	3	-12.6	4	-23.8	2	8.9		

TU101		4	4.9	9	9.0	14	N/C
pin	volt	5	4.9	10	3.9	15	N/C
1	8.8	6	GND	11	GND	16	0.1
2	30.5	7	3.5	12	N/C	17	0.1
3	5.0	8	0	13	N/C	18	3.1

All voltages are in V

A BOARD TRANSISTOR VOLTAGE LIST

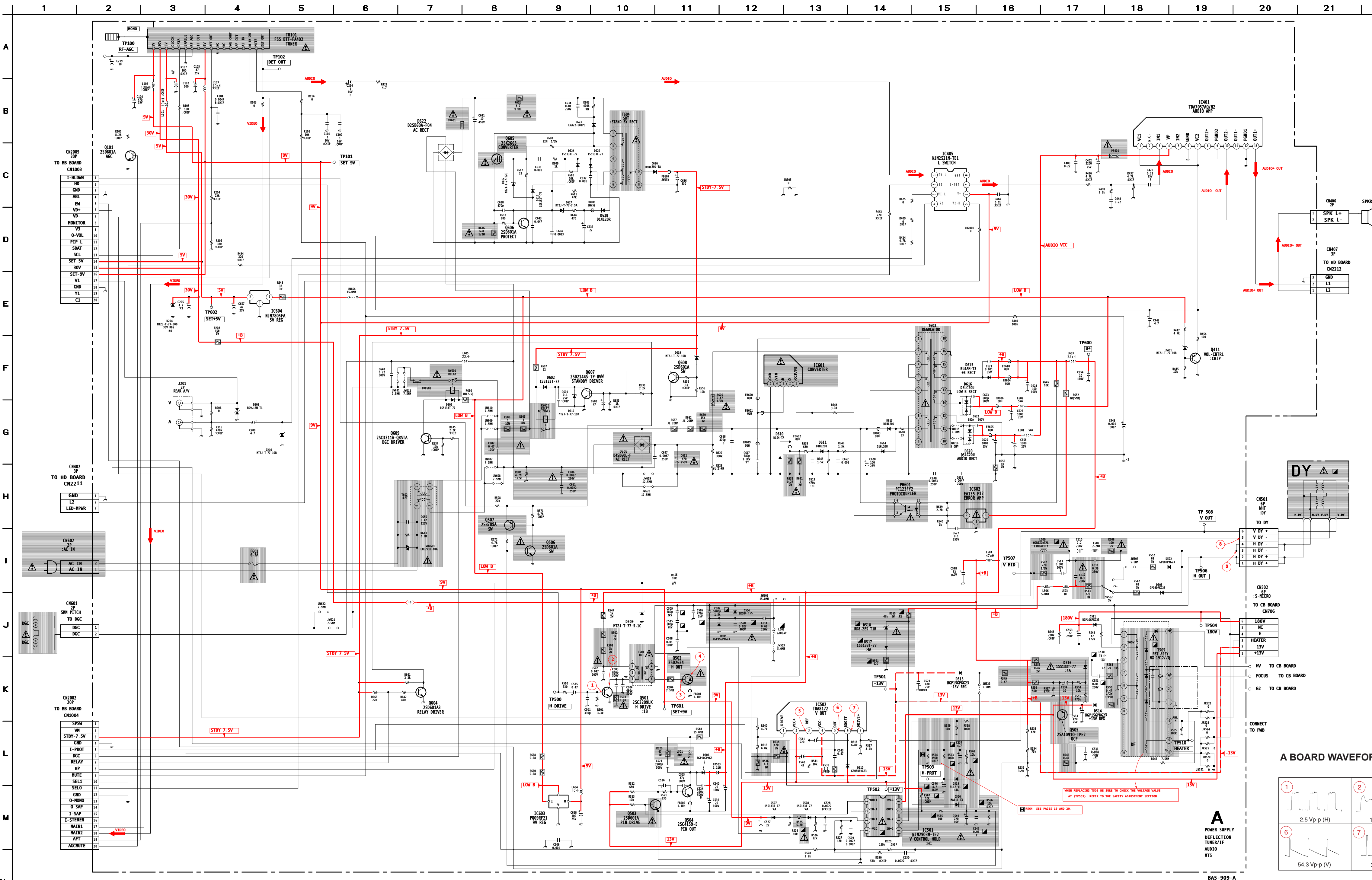
Q101		Q502		Q505		Q604		Q608	
pin	volt	pin	volt	pin	volt	pin	volt	pin	volt
B	0.0	B	-0.1	B	134.9	B	0.1	B	0.0
C	5.6	C	133	C	1.8	C	4.1	C	0.7
E	GND	E	GND	E	135.5	E	GND	E	GND
Q411		Q503		Q506		Q606		Q609	
pin	volt	pin	volt	pin	volt	pin	volt	pin	volt
B	5.3	B	0.2	B	0.0	B	-36.1	B	0.0
C	GND	C	3.8	C	0.0	C	-35.3	C	13.9
E	5.2	E	0.0	E	GND	E	-36.3	E	GND
Q501		Q504		Q507		Q607		All voltages are in V	
pin	volt	pin	volt	pin	volt	pin	volt		
B	0.0	B	0.1	B	0.0	B	0.7		
C	93.3	C	-6.5	C	0.0	C	0.1		
E	GND	E	0.0	E	0.0	E	GND		

A BOARD TRANSISTOR VOLTAGE LIST

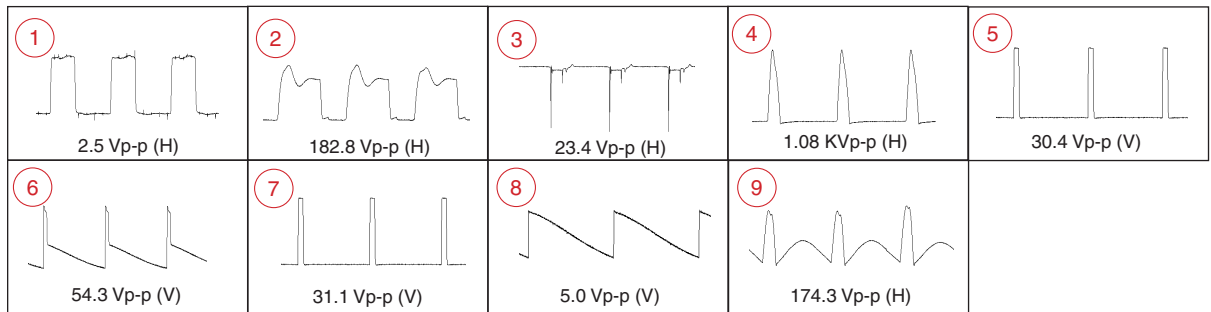
Q605	
pin	volt
D	-35.6
G	40.8
S	36.8

All voltages are in V

A BOARD SCHEMATIC DIAGRAM



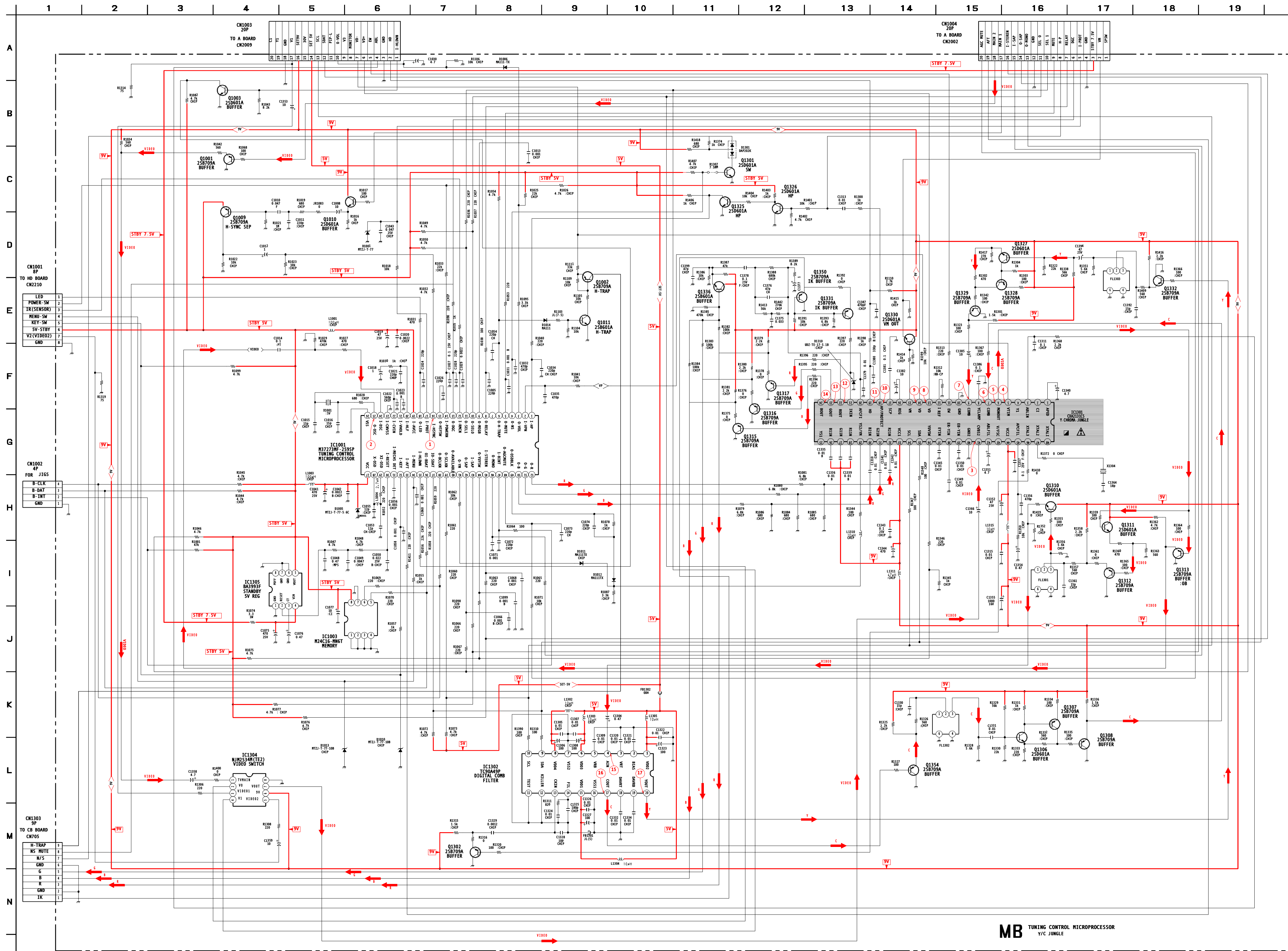
A BOARD WAVEFORMS



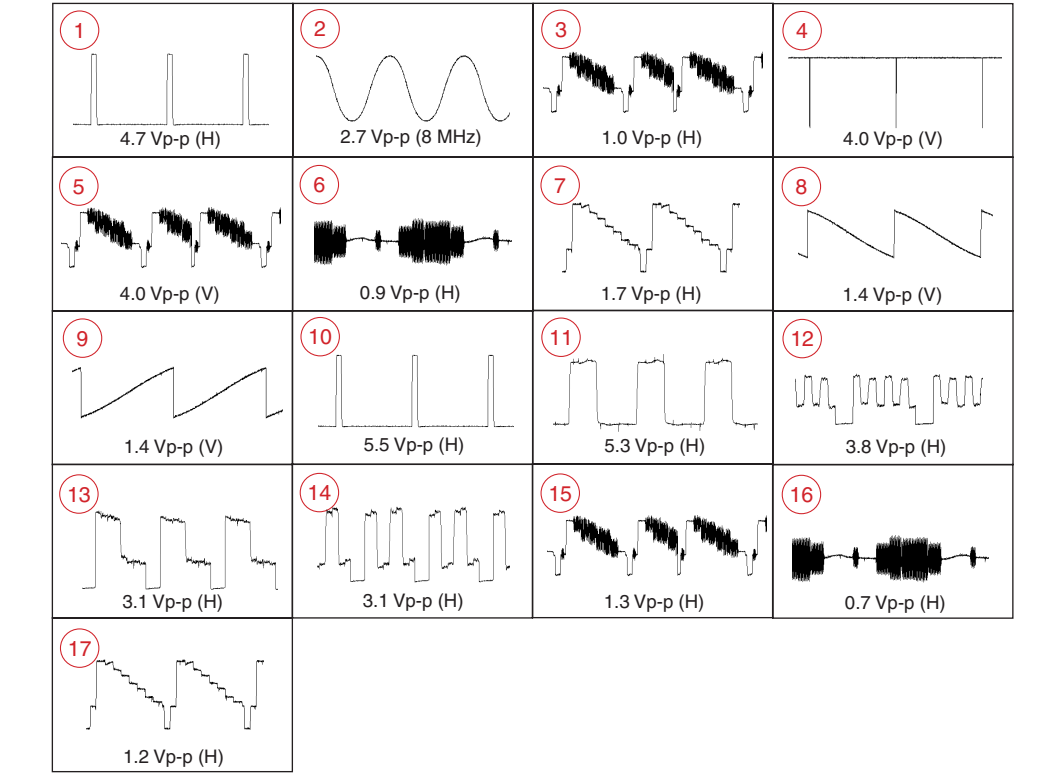
A
POWER SUPPLY
DEFLECTION
TUNER/IF
AUDIO
RTS

BAS-909-A

MB BOARD SCHEMATIC DIAGRAM



MB BOARD WAVFORMS



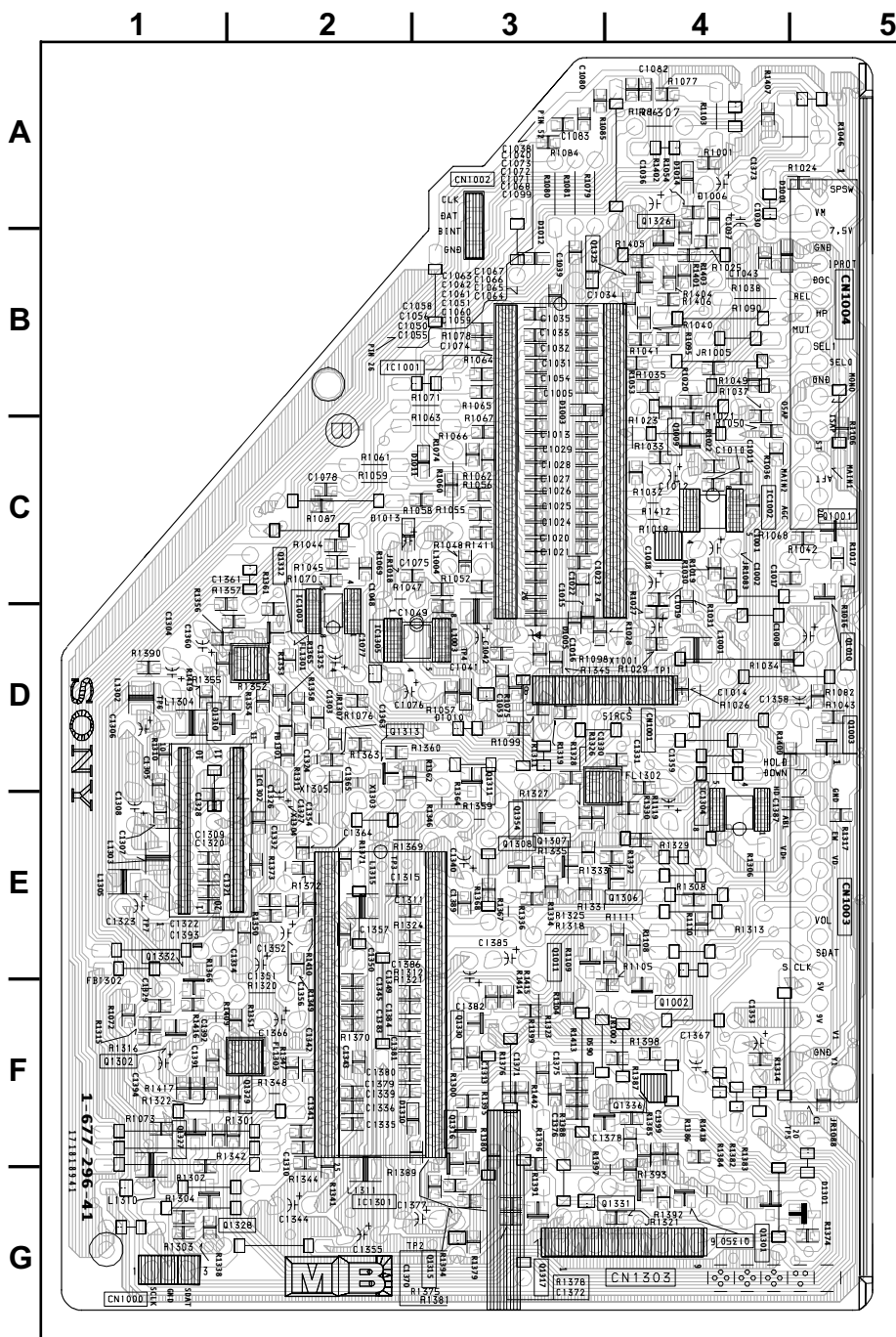
MB TUNING CONTROL MICROPROCESSOR Y/C JUNGLE

MB BOARD IC VOLTAGE

IC1001		IC1003		43	5.1
pin	volt	pin	volt	44	8.7
1	1.7	1	GND	45	5.2
2	4.8	2	GND	46	4.6
3	0.0	3	GND	47	1.7
4	0.4	4	GND	48	0.2
5	0.0	5	4.8	IC1302	
6	0.1	6	4.8	pin	volt
7	NC	7	GND	1	5.0
8	0.0	8	5.0	2	1.4
9	0.0	IC1301		3	3.2
10	0.1	pin	volt	4	2.4
11	0.1	1	3.3	5	1.9
12	5.0	2	5.1	6	5.0
13	0.0	3	1.3	7	0.0
14	4.3	4	5.1	8	5.0
15	4.9	5	4.8	9	4.9
16	0.0	6	4.3	10	4.9
17	-0.2	7	6.3	11	0.0
18	4.9	8	5.0	12	0.0
19	5.0	9	5.1	13	2.5
20	2.1	10	GND	14	2.1
21	0.2	11	4.1	15	5.0
22	2.3	12	2.4	16	0.0
23	GND	13	3.5	17	2.5
24	2.2	14	3.5	18	3.2
25	2.3	15	5.4	19	1.9
26	0.0	16	7.7	20	2.4
27	4.9	17	1.6	IC1304	
28	2.2	18	3.5	pin	volt
29	2.3	19	2.3	1	4.6
30	5.0	20	2.6	2	0.1
31	0.0	21	1.5	3	4.6
32	5.0	22	1.5	4	0.1
33	2.4	23	1.6	5	4.6
34	4.4	24	1.4	6	8.9
35	5.0	25	NC	7	3.8
36	4.8	26	4.6	8	GND
37	4.8	27	4.6	IC1305	
38	4.8	28	4.6	pin	volt
39	4.8	29	0.0	1	GND
40	NC	30	4.5	2	5.0
41	0.0	31	4.5	3	1.6
42	0.1	32	4.5	4	7.4
43	5.0	33	8.7	5	5.0
44	0.1	34	4.9	6	GND
45	5.0	35	4.8	7	GND
46	0.0	36	0.2	8	NC
47	5.0	37	4.6	All voltages are in V	
48	0.0	38	5.3		
49	0.0	39	5.3		
50	0.0	40	GND		
51	0.0	41	5.1		
52	0.0	42	6.2		

MB BOARD TRANSISTOR VOLTAGE

Q1001		Q1011		Q1308		Q1315		Q1327		Q1332	
pin	volt	pin	volt	pin	volt	pin	volt	pin	volt	pin	volt
B	4.8	B	0.0	B	5.7	B	1.4	B	2.4	B	2.4
C	GND	C	3.5	C	GND	C	GND	C	7.6	C	GND
E	5.4	E	GND	E	6.3	E	2.0	E	1.8	E	3.0
Q1002		Q1301		Q1310		Q1316		Q1328		Q1336	
pin	volt	pin	volt	pin	volt	pin	volt	pin	volt	pin	volt
B	3.5	B	0.4	B	2.4	B	1.6	B	7.6	B	2.0
C	3.5	C	2.3	C	8.7	C	GND	C	4.5	C	8.9
E	3.5	E	GND	E	1.8	E	2.2	E	8.3	E	1.7
Q1003		Q1302		Q1311		Q1317		Q1329		Q1350	
pin	volt	pin	volt	pin	volt	pin	volt	pin	volt	pin	volt
B	0.0	B	4.6	B	0.0	B	1.5	B	4.5	B	3.6
C	5.0	C	GND	C	8.9	C	GND	C	GND	C	GND
E	GND	E	5.2	E	3.7	E	2.2	E	5.1	E	3.6
Q1009		Q1306		Q1312		Q1325		Q1330		Q1354	
pin	volt	pin	volt	pin	volt	pin	volt	pin	volt	pin	volt
B	5.2	B	2.4	B	2.0	B	0.6	B	4.9	B	0.0
C	0.8	C	7.5	C	GND	C	0.7	C	8.9	C	GND
E	5.0	E	1.8	E	0.0	E	GND	E	4.3	E	3.2
Q1010		Q1307		Q1313		Q1326		Q1331		All voltages are in V	
pin	volt	pin	volt	pin	volt	pin	volt	pin	volt		
B	4.5	B	0.0	B	4.3	B	0.0	B	3.6		
C	8.7	C	5.7	C	GND	C	3.8	C	1.6		
E	3.8	E	8.2	E	5.0	E	GND	E	3.6		

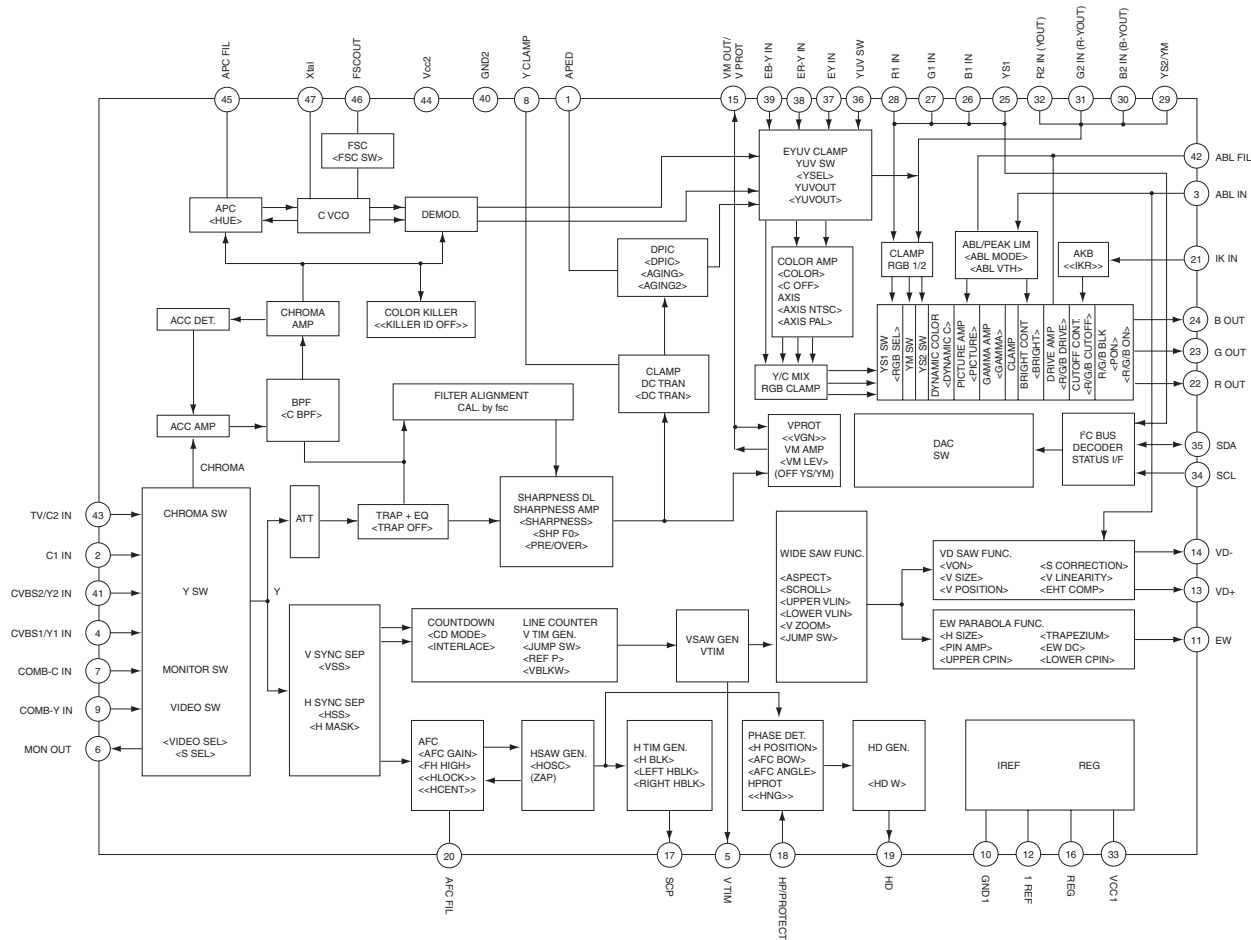


MB BOARD LOCATOR LIST

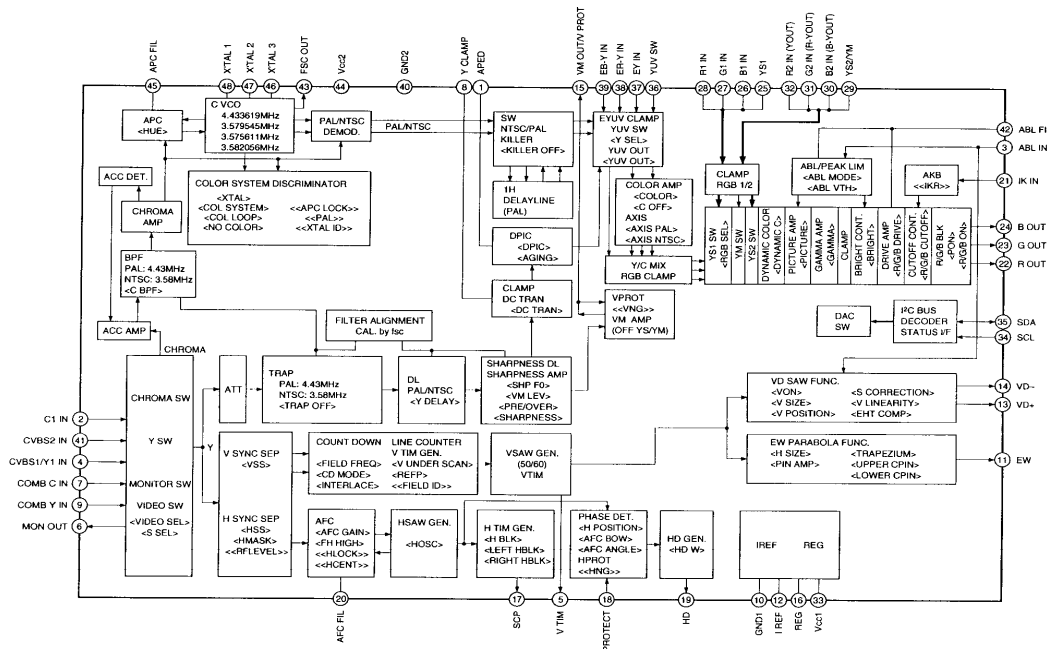
DIODE	D1013	C-2	IC1302	E-1	Q1010	C-5	Q1311	E-3	Q1327	F-2	Q1354	D-3
D1001	B-5	D1014	A-4	IC1304	E-4	Q1011	E-3	Q1312	D-2	Q1328	G-1	CRYSTAL
D1003	C-3	D1301	G-5	IC1305	D-3	Q1301	G-5	Q1313	D-2	Q1329	F-2	X1001
D1005	D-3	D1310	F-3	TRANSISTOR	Q1302	F-1	Q1315	G-3	Q1330	F-3	X1303	E-2
D1006	D-3	IC	Q1001	C-5	Q1306	E-4	Q1316	F-3	Q1331	G-4	X1304	E-2
D1010	D-3	IC1001	C-3	Q1002	F-4	Q1307	E-3	Q1317	G-3	Q1332	F-1	X1305
D1011	C-3	IC1003	D-2	Q1003	D-5	Q1308	E-3	Q1325	B-4	Q1336	F-4	
D1012	B-3	IC1301	F-2	Q1009	C-4	Q1310	D-2	Q1326	B-4	Q1350	G-4	

MB BOARD IC BLOCK DIAGRAMS

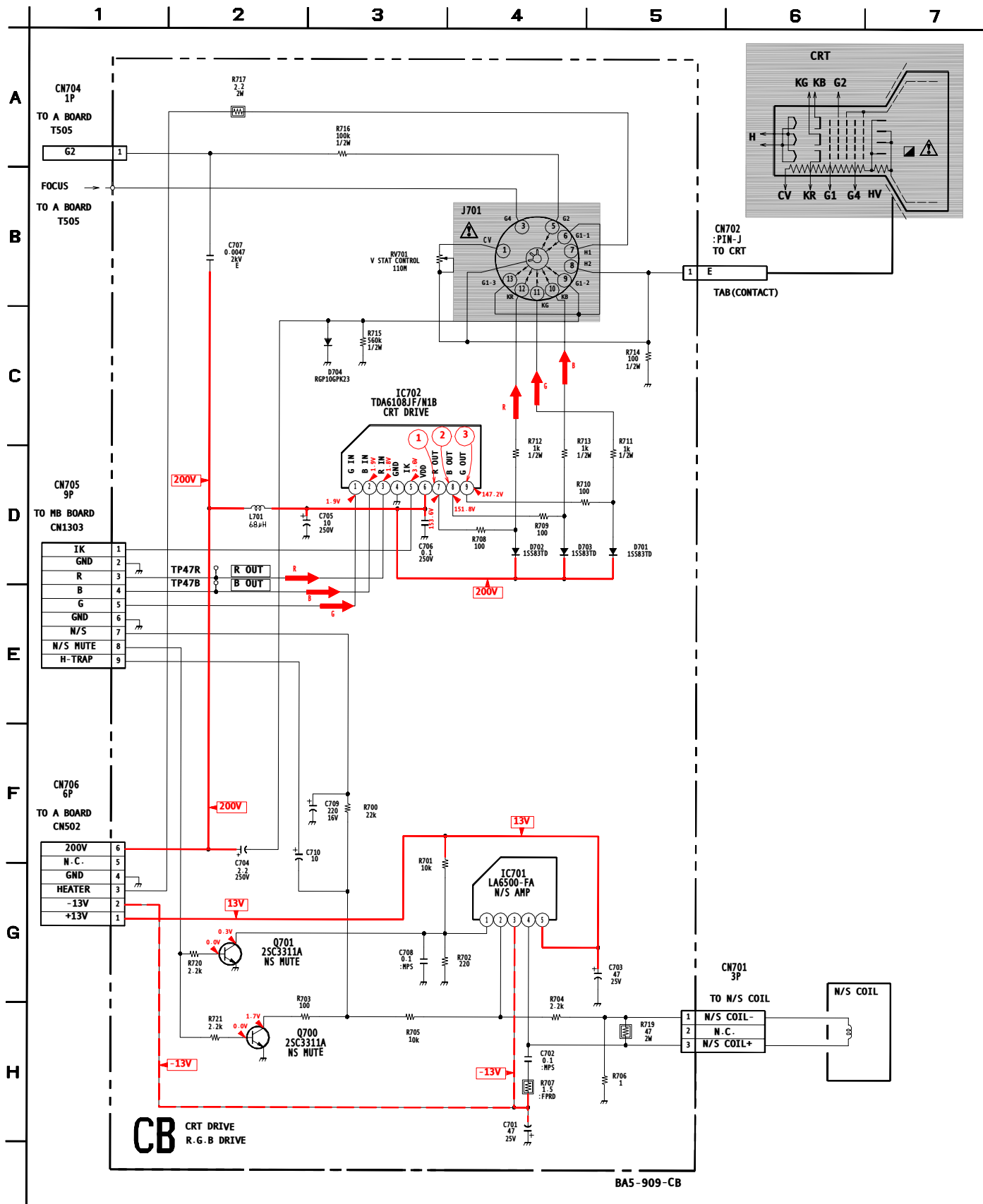
MB BOARD: IC1301 CXA2131AS



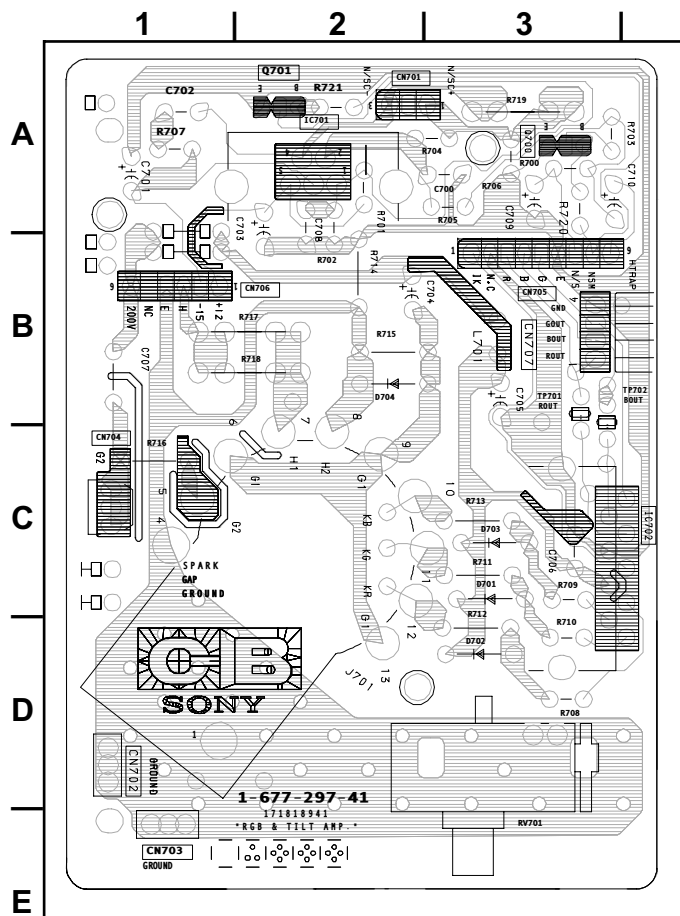
MB BOARD: IC1301 CXA2135S



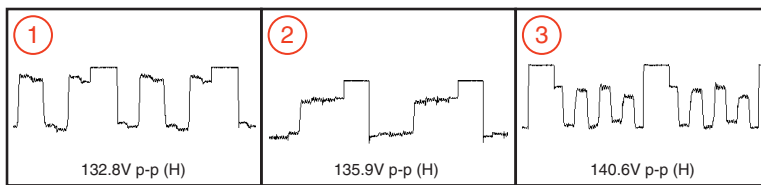
CB BOARD SCHEMATIC DIAGRAM



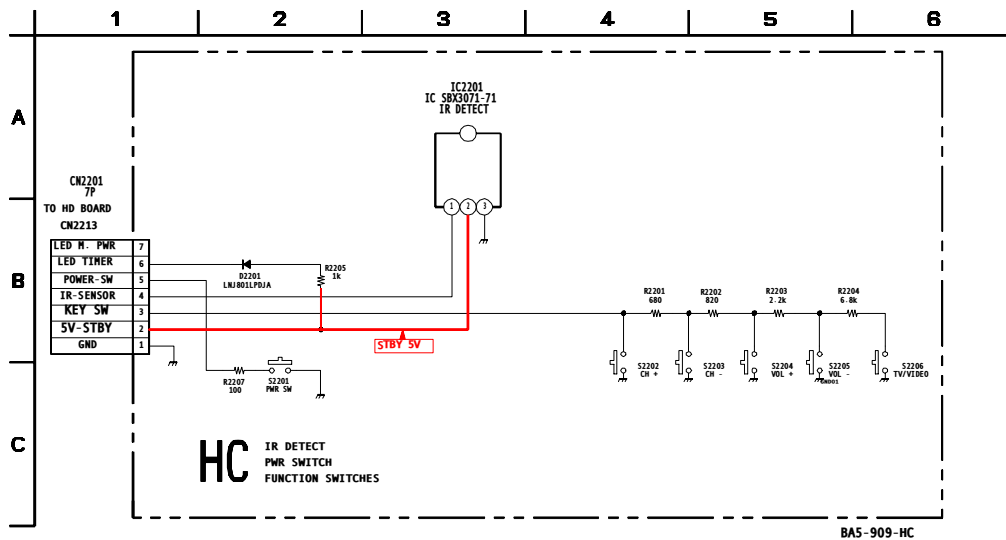
CB [CRT DRIVE, RGB DRIVE]



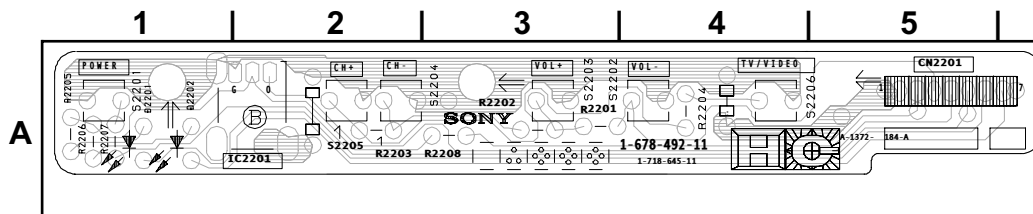
CB BOARD WAVEFORMS



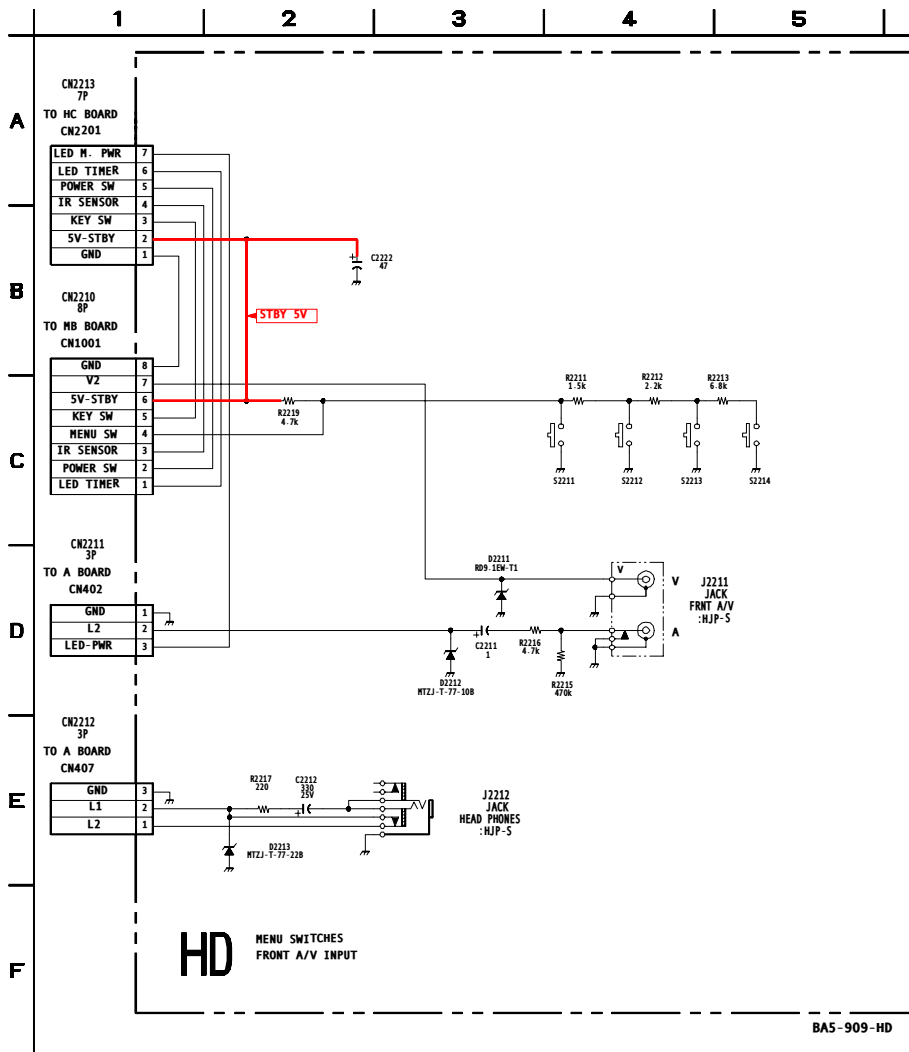
HC BOARD SCHEMATIC DIAGRAM



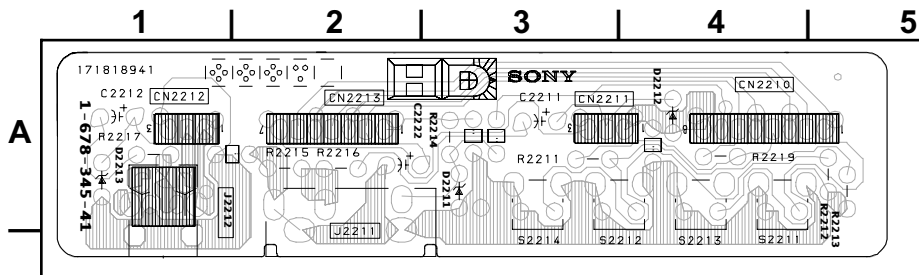
HC [IR-DETECT/POWER SWITCH FUNCTION SWITCHES]



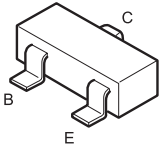
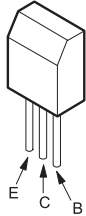
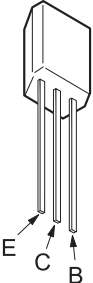
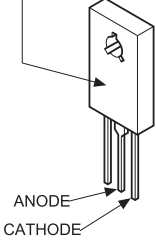
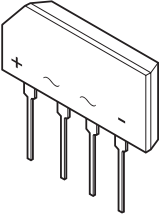
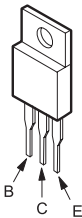
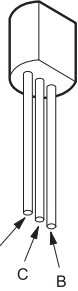
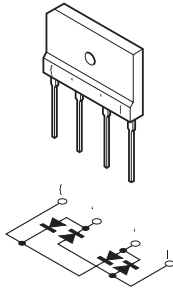
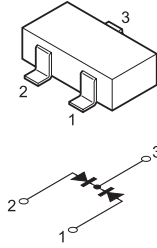
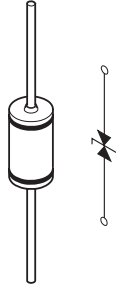
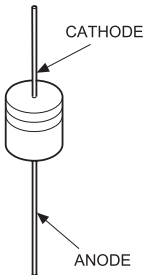
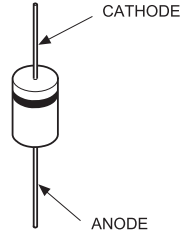
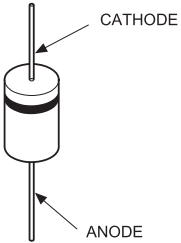
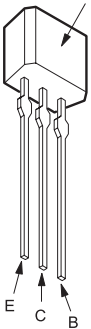
HD BOARD SCHEMATIC DIAGRAM



HD [MENU SWITCHES, FRONT A/V INPUT]



5-4. SEMICONDUCTORS

<p>2SB709A-QRS-TX 2SD601A-QRS-TX 2SC2412K-T-146-QR</p> 	<p>2SC3209LK-TP</p> 	<p>2SC331740S-QRT</p> 	<p>D5LC20U</p> <p>MARKING SIDE VIEW</p> 	<p>D2SB60A-F04</p> 
<p>2SA1837 2SC4159-E</p> 	<p>2SA1091Q-TPE2 2SA993SA-QRT</p> 	<p>2SK2845-LB102 D4SB60L-F</p> 	<p>DAP202K-T-146</p> 	<p>RD9.1EW-T1</p> 
<p>1SS133T-77 D1N20R-TA D1NS4-TA MTZJ-T-7712C MTZJ-T-77-39 RD8.2ES-T1B</p> 	<p>ERC06-15S MTZJ-T-77-5.1C MTZJ-T-775.6C MTZJ-T-77-7.5A MTZJ-T-77-8.2B MTZJ-T-77-10B MTZJ-T-7730D RD10ES-T1B</p> 	<p>1SS83TD D1NL20R-TA EL1Z-V1 ERA22-08TP3 GP08DPKG23 RGP10GPKG23 RU4AM-T3</p> 	<p>2SA1309A-QRT 2SC3311A-QRSTA 2SD2144S-TP-UVW</p> <p>LETTER SIDE</p> 	


SECTION 6: EXPLODED VIEWS

Components not identified by a part number or description are not stocked because they are seldom required for routine service.

The component parts of an assembly are indicated by the reference numbers in the far right column of the parts list and within the dotted lines of the diagram.

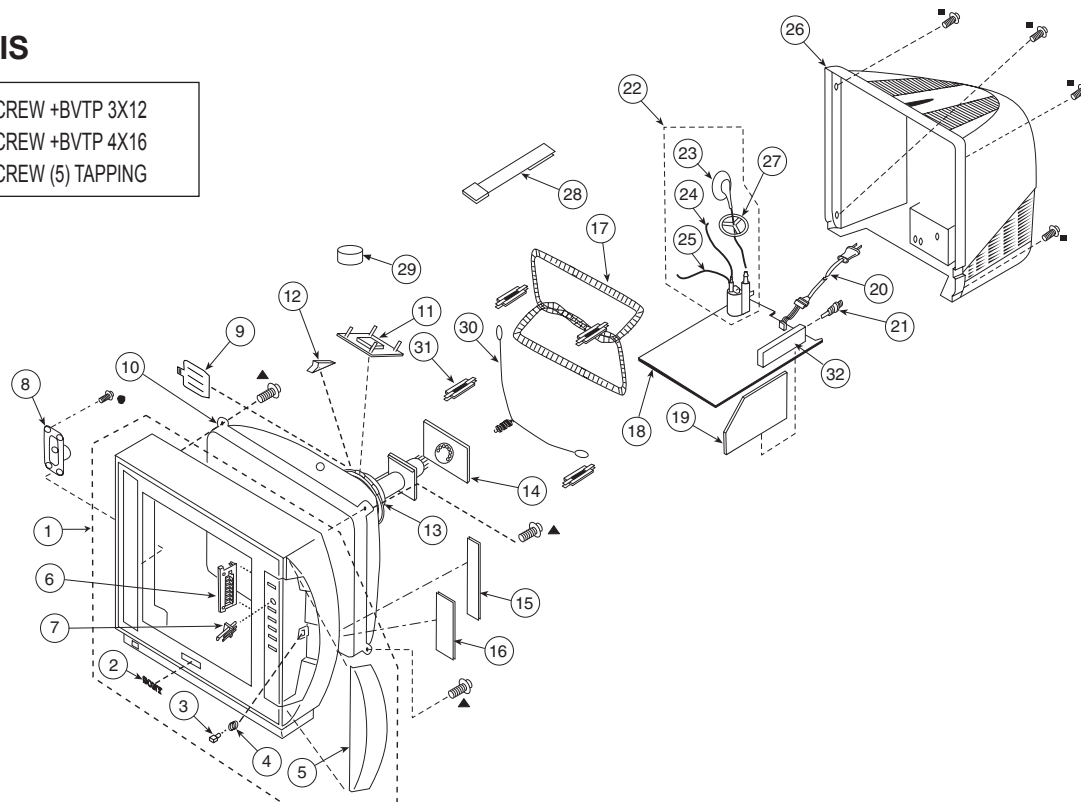
* Items marked with an asterisk are not stocked since they are seldom required for routine service. Expect some delay when ordering these components.











NOTE: The components identified by shading and  mark are critical for safety. Replace only with part number specified.

NOTE: Les composants identifiés par un trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.


6-1. CHASSIS


- 7-685-648-71 SCREW +BVTP 3X12
- 7-685-663-71 SCREW +BVTP 4X16
- ▲ 4-365-808-01 SCREW (5) TAPPING




REF.NO.	PART NO.	DESCRIPTION	[Assembly Includes]	REF.NO.	PART NO.	DESCRIPTION	[Assembly Includes]
1	X-4037-635-2	BEZNET ASSY (KV-13FM13 only)	2-5	18	* A-1299-219-A	A BOARD, COMPLETE	
1	X-4037-632-2	BEZNET ASSY (KV-13FM14 only)	2-5			The high-voltage leads associated with the FBT on this board are not included and must be ordered separately. (See 23-25)	
2	3-704-176-61	EMBLEM (NO.6), SONY		19	* A-1304-197-A	MB (VAR) BOARD, MOUNTED	
3	4-392-036-01	CATCHER, PUSH		20	 1-791-935-11	CORD, AC POWER(WITH CONNECTOR)(KV-13FM14 only)	
4	4-076-248-01	SPRING, DOOR		20	 1-790-316-31	CORD, AC POWER(WITH CONNECTOR)(KV-13FM13 only)	
5	4-075-399-21	DOOR (KV-13FM14 only)		21	1-766-374-11	PLUG, F-PIN	
5	4-075-399-41	DOOR (KV-13FM13 only)		22	 1-453-339-11	FBT ASSY NX-1912/M3E4	23-25
6	4-075-400-01	BUTTON, MULTI		23	 1-473-159-11	HV CAP ASSY	
7	4-075-401-01	GUIDE, LED		24	 1-900-800-65	FOCUS LEAD	
8	1-529-613-11	SPEAKER (9X5CM)		25	 1-900-803-22	G2 LEAD	
9	2-163-920-01	PLATE, TLH CORRECTION		26	4-076-249-11	COVER, REAR (KV-13FM13 only)	
10	 8-735-570-05	CRT 14RSN (A34LRG70X)		26	4-076-249-21	COVER, REAR (KV-13FM14 only)	
11	1-452-728-61	COIL, NA ROTATION		27	3-704-372-71	HOLDER, HV CABLE	
12	4-053-005-01	SPACER, DY		28	4-051-735-42	PIECE A(75), CONV. CORRECT	
13	 8-451-401-11	DY Y14RSA-S		29	1-452-032-00	MAGNET,DISC	
14	* A-1332-062-A	CB (VAR) BOARD, MOUNTED		30	4-375-394-01	SPRING, TENSION	
15	* A-1372-814-A	HC (VAR) BOARD, MOUNTED		31	4-069-972-01	CLIP (14RSN), DGC	
16	* A-1372-816-A	HD (COM) BOARD, MOUNTED		32	 8-598-501-30	TUNER, FSS BTF-FA402	
17	 1-419-559-21	COIL, DEGAUSSING					

SECTION 7: ELECTRICAL PARTS LIST

NOTE: The components identified by shading and  mark are critical for safety. Replace only with part number specified.

NOTE: Les composants identifies per un frame et une marque  sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

The components in this manual identified by the following symbol:  indicate parts that have been carefully factory-selected to satisfy regulations regarding X-ray radiation for each set.

Should replacement be required for one of these components, replace only with the value originally used.











* Items marked with an asterisk are not stocked since they are seldom required for routine service. Expect some delay when ordering these components.

RESISTORS

- All resistors are in ohms
- F : nonflammable
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.



When ordering parts by reference number, please include the board name.


REF.NO.	PART NO.	DESCRIPTION	VALUES	REF.NO.	PART NO.	DESCRIPTION	VALUES
							
*	A-1299-219-A	A BOARD, COMPLETE					
*	1-508-784-21	PIN,CONNECTOR (5MM PITCH)	1P				
	1-533-223-11	HOLDER, FUSE					
*	4-374-846-11	COVER, CAPACITOR, CAP TYPE					
	4-382-854-11	SCREW (M3X10), P, SW (+)					
	The high-voltage leads associated with the FBT on this board are not included and must be ordered separately. Order the following leads when requesting this A Board:						
	1-473-159-11	HV CAP ASSY					
	1-900-800-65	FOCUS LEAD					
	1-900-803-22	G2 LEAD					
	CAPACITOR						
C100	1-164-346-11	CERAMIC CHIP	1µF 16V				
C101	1-164-346-11	CERAMIC CHIP	1µF 16V				
C102	1-126-933-11	ELECT	100µF 20% 16V				
C104	1-126-941-11	ELECT	470µF 20% 25V				
C105	1-104-664-11	ELECT	47µF 20% 25V				
C204	1-163-017-00	CERAMIC CHIP	.0047µF 10% 50V				
C205	1-126-963-11	ELECT	4.7µF 20% 50V				
C208	1-126-963-11	ELECT	4.7µF 20% 50V				
C214	1-164-346-11	CERAMIC CHIP	1µF 16V				
C219	1-126-964-11	ELECT	10µF 20% 50V				
C402	1-126-943-11	ELECT	2200µF 20% 25V				
C403	1-126-957-11	ELECT	0.22µF 20% 50V				
C420	1-164-222-11	CERAMIC CHIP	0.22µF 25V				
C442	1-126-963-11	ELECT	4.7µF 20% 50V				
C443	1-163-009-11	CERAMIC CHIP	0.001µF 10% 50V				
C444	1-163-021-91	CERAMIC CHIP	0.01µF 10% 50V				
C448	1-164-222-11	CERAMIC CHIP	0.22µF 25V				
C501	1-102-112-00	CERAMIC	330pF 10% 50V				
C502	1-106-383-00	MYLAR	0.047µF 10% 200V				
C503	1-102-212-00	CERAMIC	820pF 10% 500V				
				C504	1-102-002-00	CERAMIC	680pF 10% 500V
				C505	1-162-134-11	CERAMIC	470pF 10% 2KV
				C506	1-162-318-11	CERAMIC	0.001µF 10% 500V
				 C507	1-117-638-11	FILM	5700pF 3% 1.2KV
				C508	1-137-150-11	MYLAR	0.01µF 10% 100V
				C509	1-162-116-00	CERAMIC	680pF 10% 2KV
				C510	1-107-649-11	ELECT	2.2µF 20% 250V
				 C511	1-117-666-11	FILM	0.39µF 5% 250V
				 C512	1-104-999-11	MYLAR	0.1µF 10% 200V
				C513	1-104-987-11	MYLAR	0.001µF 10% 100V
				 C514	1-109-844-11	FILM	0.68µF 5% 250V
				C515	1-162-116-00	CERAMIC	680pF 10% 2KV
				 C520	1-129-719-00	FILM	0.027µF 5% 400V
				C521	1-164-646-11	CERAMIC	2200pF 10% 500V
				C523	1-126-941-11	ELECT	470µF 20% 25V
				C524	1-102-244-00	CERAMIC	220pF 10% 500V
				C525	1-162-815-11	CERAMIC	47pF 5% 500V
				C526	1-126-960-11	ELECT	1µF 20% 50V
				C527	1-126-965-11	ELECT	22µF 20% 50V
				C528	1-164-161-11	CERAMIC CHIP	0.0022µF 10% 50V
				C529	1-164-161-11	CERAMIC CHIP	0.0022µF 10% 50V
				C530	1-164-161-11	CERAMIC CHIP	0.0022µF 10% 50V
				C531	1-106-387-00	MYLAR	0.068µF 10% 200V
				C533	1-126-941-11	ELECT	470µF 20% 25V
				 C534	1-126-964-11	ELECT	10µF 20% 50V
				C535	1-126-959-11	ELECT	0.47µF 20% 50V
				 C537	1-126-963-11	ELECT	4.7µF 20% 50V
				C539	1-107-645-11	ELECT	22µF 20% 160V
				C540	1-107-645-11	ELECT	22µF 20% 160V
				C541	1-126-969-11	ELECT	220µF 20% 50V
				C542	1-126-967-11	ELECT	47µF 20% 50V
				C543	1-137-194-81	FILM	0.47µF 5% 50V
				 C546	1-107-635-11	ELECT	4.7µF 20% 160V
				 C547	1-163-031-11	CERAMIC CHIP	0.01µF 50V
				C548	1-123-024-21	ELECT	33µF 160V


NOTE: The components identified by shading and \triangle mark are critical for safety. Replace only with part number specified.

NOTE: Les composants identifiés par un trame et une marque \triangle sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifique.

















REF.NO.	PART NO.	DESCRIPTION	VALUES	REF.NO.	PART NO.	DESCRIPTION	VALUES
\triangle C549	1-126-934-11	ELECT	220 μ F 20% 16V	* CN601	1-508-786-00	PIN,CONNECTOR (5MM PITCH)	2P
C551	1-107-364-11	MYLAR	0.01 μ F 10% 200V	CN602	1-580-843-11	PIN,CONNECTOR (POWER)	
C553	1-107-662-11	ELECT	22 μ F 20% 250V	CN2002	1-573-298-21	CONNECTOR, BOARD TO BOARD 20P	
C601	1-164-004-11	CERAMIC CHIP	0.1 μ F 10% 25V	CN2009	1-573-298-21	CONNECTOR, BOARD TO BOARD 20P	
C602	1-126-967-11	ELECT	47 μ F 20% 50V				
C604	1-164-182-11	CERAMIC CHIP	0.0033 μ F 10% 50V			DIODE	
\triangle C606	1-113-920-11	CERAMIC	0.0022 μ F 20% 250V	D204	8-719-982-22	DIODE MTZJ-T-77-30D	
\triangle C607	1-136-311-11	MYLAR	0.47 μ F 20% 125V	D208	8-719-108-12	DIODE RD9.1EW-T1	
\triangle C611	1-113-920-11	CERAMIC	0.0022 μ F 20% 250V	D210	8-719-110-17	DIODE MTZJ-T-77-10B	
\triangle C612	1-117-893-11	ELECT	470 μ F 20% 250V	D401	8-719-110-17	DIODE MTZJ-T-77-10B	
C617	1-125-893-11	FILM	680pF 3% 1.5KV	D502	8-719-908-03	DIODE GP08DPKG23	
C618	1-164-081-11	CERAMIC	470pF 10% 50V	D503	8-719-908-03	DIODE GP08DPKG23	
C619	1-136-356-11	MYLAR	470pF 5% 50V	\triangle D504	8-719-945-80	DIODE ERC06-15S	
C620	1-104-665-11	ELECT	100 μ F 20% 25V	\triangle D505	8-719-979-85	DIODE RGP15GPKG23	
C621	1-117-214-11	CERAMIC	0.001 μ F 10% 2KV	D506	8-719-302-43	DIODE RGP10GPKG3	
C622	1-164-625-11	CERAMIC	680pF 10% 500V	D507	8-719-991-33	DIODE 1SS133T-77	
C623	1-164-625-11	CERAMIC	680pF 10% 500V	D508	8-719-991-33	DIODE 1SS133T-77	
C624	1-131-867-51	ELECT	100 μ F 160V	D509	8-719-921-44	DIODE MTZJ-T-77-5.1C	
C625	1-135-412-51	ELECT	1000 μ F 20% 25V	D510	8-719-908-03	DIODE GP08DPKG23	
C626	1-135-412-51	ELECT	1000 μ F 20% 25V	D511	8-719-302-43	DIODE RGP10GPKG23	
C627	1-136-189-00	MYLAR	0.1 μ F 10% 250V	D513	8-719-979-85	DIODE RGP15GPKG23	
C628	1-104-665-11	ELECT	100 μ F 20% 25V	D514	8-719-979-85	DIODE RGP15GPKG23	
C630	1-113-923-11	CERAMIC	0.0033 μ F 20% 250V	\triangle D516	8-719-991-33	DIODE 1SS133T-77	
C631	1-113-924-11	CERAMIC	.0047 μ F 20% 250V	\triangle D517	8-719-991-33	DIODE 1SS133T-77	
C634	1-137-605-11	MYLAR	0.01 μ F 10% 250V	\triangle D518	8-719-110-08	DIODE MTZJ-T-77-8.2B	
C635	1-163-009-11	CERAMIC CHIP	0.001 μ F 10% 50V	\triangle D519	8-719-979-84	DIODE EGP20DPKG23	
C636	1-126-970-11	ELECT	330 μ F 20% 50V	\triangle D520	8-719-073-01	DIODE MA111-TX	
C637	1-163-009-11	CERAMIC CHIP	0.001 μ F 10% 50V	D601	8-719-991-33	DIODE 1SS133T-77	
C638	1-163-005-11	CERAMIC CHIP	470pF 10% 50V	D602	8-719-991-33	DIODE 1SS133T-77	
C639	1-126-965-11	ELECT	22 μ F 20% 50V	\triangle D605	8-719-510-53	DIODE D4SB60L-F	
C641	1-107-679-91	ELECT	10 μ F 20% 450V	D610	8-719-210-21	DIODE 11EQS04-NTA1B	
C643	1-104-760-11	CERAMIC CHIP	0.047 μ F 10% 50V	D611	8-719-046-74	DIODE 10ELS2N-TA1B2	
C647	1-161-964-91	CERAMIC	.0047 μ F 250V	D612	8-719-110-17	DIODE MTZJ-T-77-10B	
C648	1-136-346-21	MYLAR	0.22 μ F 20% 125V	D613	8-719-046-74	DIODE 10ELS2N-TA1B2	
C652	1-130-471-00	MYLAR	0.001 μ F 5% 50V	D614	8-719-046-74	DIODE 10ELS2N-TA1B2	
C654	1-107-636-11	ELECT	10 μ F 20% 160V	D615	8-719-312-10	DIODE RU4AM-T3	
\triangle C655	1-136-311-11	MYLAR	0.47 μ F 20% 125V	D616	8-719-510-37	DIODE D5LC20U	
C657	1-104-664-11	ELECT	47 μ F 20% 25V	D617	8-719-110-31	DIODE MTZJ-T-77-12C	
C658	1-135-412-51	ELECT	1000 μ F 20% 25V	D618	8-719-991-33	DIODE 1SS133T-77	
		CONNECTOR		D619	8-719-110-17	DIODE MTZJ-T-77-10B	
* CN402	1-564-506-11	PLUG,CONNECTOR	3P	D620	8-719-510-37	DIODE D5LC20U	
CN406	1-564-505-11	PLUG,CONNECTOR	2P	D622	8-719-077-76	DIODE D2SB60A-F04	
* CN407	1-564-506-11	PLUG,CONNECTOR	3P	D623	8-719-081-70	DIODE BA159DGPKG3	
* CN501	1-580-798-11	CONNECTOR PIN (DY)	6P	D624	8-719-991-33	DIODE 1SS133T-77	
CN502	1-564-509-11	PLUG,CONNECTOR	6P	D625	8-719-991-33	DIODE 1SS133T-77	
				D626	8-719-046-74	DIODE 10ELS2N-TA1B2	

NOTE: The components identified by shading and  mark are critical for safety. Replace only with part number specified.

NOTE: Les composants identifiés par un trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifique.



REF.NO.	PART NO.	DESCRIPTION	VALUES	REF.NO.	PART NO.	DESCRIPTION	VALUES
D627	8-719-110-03	DIODE MTZJ-T-77-7.5A		JR2001	1-216-295-11	SHORT	
D628	8-719-510-48	DIODE D1N20R-TA		JR2003	1-216-295-11	SHORT	
FUSE				COIL			
	F601	1-576-193-11	FUSE 6.3A/125V	L101	1-412-029-11	INDUCTOR	10µH
FERRITE BEAD				L102	1-412-032-11	INDUCTOR	100µH
FB501	1-410-397-21	FERRITE	1.1µH	L103	1-412-029-11	INDUCTOR	10µH
FB502	1-410-397-21	FERRITE	1.1µH		L501	1-409-955-11	INDUCTOR 8MH
FB503	1-410-397-21	FERRITE	1.1µH	L502	1-412-552-11	INDUCTOR	2.2MH
FB600	1-412-911-11	FERRITE	0µH	L503	1-406-677-11	INDUCTOR	10MH
FB601	1-412-911-11	FERRITE	0µH	L504	1-412-533-21	INDUCTOR	47µH
FB602	1-412-911-11	FERRITE	0µH	L508	1-406-982-41	INDUCTOR	680µH
FB603	1-412-911-11	FERRITE	0µH		L509	1-419-488-11	COIL, HORIZONTAL LINEARITY
FB604	1-412-911-11	FERRITE	0µH	L510	1-412-528-11	INDUCTOR	18µH
FB605	1-412-911-11	FERRITE	0µH	L603	1-412-529-11	INDUCTOR	22µH
FB606	1-412-911-11	FERRITE	0µH	L604	1-412-525-31	INDUCTOR	10µH
FB609	1-412-911-11	FERRITE	0µH	L605	1-412-529-11	INDUCTOR	22µH
FB610	1-412-911-11	FERRITE	0µH	PHOTO COUPLER			
IC					PH601	8-749-010-64	PHOTO COUPLER PC123FY2
IC401	8-759-490-17	IC TDA7057AQ/N2		IC LINK			
IC405	8-759-450-93	IC NJM2521M-TE1			PS401	1-576-413-21	LINK, IC
	IC501	8-759-700-07	IC NJM2903M-TE2	TRANSISTOR			
IC502	8-759-980-58	IC TDA8172		Q101	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX	
	IC601	8-749-018-45	IC STR-F6424	Q411	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX	
	IC602	8-749-016-47	IC EA135-F12	Q501	8-729-140-50	TRANSISTOR 2SC3209LK-TP	
IC603	8-759-653-07	IC PQ09RD21			Q502	8-729-051-69	TRANSISTOR 2SD2624
IC604	8-759-714-26	IC LM7805CT			Q503	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX
JACK				Q504	8-729-053-87	TRANSISTOR KTC4370A	
J201	1-794-115-11	JACK BLOCK, PIN 2P			Q505	8-729-200-17	TRANSISTOR 2SA1091O-TPE2
CHIP CONDUCTOR					Q506	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX
JR001	1-216-295-11	SHORT			Q507	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX
JR002	1-216-295-11	SHORT		Q604	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX	
JR403	1-216-295-11	SHORT			Q605	8-729-046-40	TRANSISTOR 2SK2663
JR501	1-216-295-11	SHORT		Q606	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX	
JR502	1-216-295-11	SHORT		Q607	8-729-922-37	TRANSISTOR 2SD2144S-TP-UVV	
JR503	1-216-295-11	SHORT		Q608	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX	
JR505	1-216-295-11	SHORT		Q609	8-729-423-33	TRANSISTOR 2SC3311A-QRSTA	
JR520	1-216-295-11	SHORT		RESISTOR			
JR521	1-216-295-11	SHORT		R101	1-216-073-00	RES-CHIP	10K 5% 1/10W
JR524	1-216-295-11	SHORT		R103	1-216-295-11	SHORT	
JR525	1-216-295-11	SHORT		R105	1-216-071-00	RES-CHIP	8.2K 5% 1/10W
JR528	1-216-295-11	SHORT		R107	1-216-025-11	RES-CHIP	100 5% 1/10W
JR529	1-216-295-11	SHORT		R108	1-216-025-11	RES-CHIP	100 5% 1/10W

NOTE: The components identified by shading and \triangle mark are critical for safety. Replace only with part number specified.

A component identified by this \boxtimes symbol indicates that it has been carefully factory-selected to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.



REF.NO.	PART NO.	DESCRIPTION	VALUES			REF.NO.	PART NO.	DESCRIPTION	VALUES		
R114	1-216-295-11	SHORT				\triangle R536	1-216-355-11	METAL OXIDE	3.3	5%	1W
R204	1-216-081-00	RES-CHIP	22K	5%	1/10W	\triangle R538	1-215-890-11	METAL OXIDE	470	5%	2W
R205	1-216-085-00	RES-CHIP	33K	5%	1/10W	R539	1-249-385-11	CARBON	2.2	5%	1/4W
R206	1-216-295-11	SHORT				R540	1-249-425-11	CARBON	4.7K	5%	1/4W
R208	1-215-924-00	METAL OXIDE	15K	5%	3W	R541	1-249-429-11	CARBON	10K	5%	1/4W
R215	1-216-113-00	RES-CHIP	470K	5%	1/10W	R542	1-215-910-00	METAL OXIDE	68	5%	3W
R409	1-216-295-11	SHORT				R543	1-247-887-00	CARBON	220K	5%	1/4W
R422	1-249-389-11	CARBON	4.7	5%	1/4W	R544	1-260-312-11	CARBON	47	5%	1/2W
R424	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	\triangle R546	1-249-377-11	CARBON	0.47	5%	1/4W
R425	1-216-295-11	SHORT				R547	1-215-892-11	METAL OXIDE	1K	5%	2W
R436	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	\triangle R549	1-260-288-11	CARBON	0.47	5%	1/2W
R437	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	\triangle R550	1-260-288-11	CARBON	0.47	5%	1/2W
R440	1-216-097-11	RES-CHIP	100K	5%	1/10W	R552	1-215-910-00	METAL OXIDE	68	5%	3W
R443	1-216-033-00	RES-CHIP	220	5%	1/10W	\triangle R553	1-216-365-00	METAL OXIDE	0.47	5%	2W
R444	1-216-033-00	RES-CHIP	220	5%	1/10W	\triangle R554	1-249-429-11	CARBON	10K	5%	1/4W
R445	1-216-073-00	RES-CHIP	10K	5%	1/10W	\triangle R555	1-247-895-91	CARBON	470K	5%	1/4W
R447	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	\triangle R556	1-249-414-11	CARBON	560	5%	1/4W
R450	1-216-061-00	RES-CHIP	3.3K	5%	1/10W	\triangle R557	1-247-895-91	CARBON	470K	5%	1/4W
R454	1-216-025-11	RES-CHIP	100	5%	1/10W	\triangle R558	1-216-097-11	RES-CHIP	100K	5%	1/10W
R501	1-247-843-11	CARBON	3.3K	5%	1/4W	\triangle R559	1-216-073-00	RES-CHIP	10K	5%	1/10W
\triangle R502	1-215-892-11	METAL OXIDE	1K	5%	2W	\triangle R560	1-215-879-11	METAL OXIDE	47K	5%	1W
\triangle R503	1-249-426-11	CARBON	5.6K	5%	1/4W	\triangle R561	1-215-416-00	METAL	620	1%	1/4W
\triangle R506	1-215-886-11	METAL OXIDE	100	5%	2W	\triangle R562	1-208-806-11	METAL CHIP	10K	0.50%	1/10W
\triangle R507	1-260-320-11	CARBON	220	5%	1/2W	\triangle R563	1-215-469-00	METAL	100K	1%	1/4W
R508	1-249-433-11	CARBON	22K	5%	1/4W	\triangle \boxtimes R564	1-216-111-00	RES-CHIP	390K	5%	1/10W
\triangle R509	1-215-892-11	METAL OXIDE	1K	5%	2W	\triangle R565	1-249-429-11	CARBON	10K	5%	1/4W
R510	1-249-411-11	CARBON	330	5%	1/4W	\triangle R566	1-216-073-00	RES-CHIP	10K	5%	1/10W
\triangle R513	1-215-913-11	METAL OXIDE	220	5%	3W	\triangle R567	1-216-073-00	RES-CHIP	10K	5%	1/10W
R516	1-249-429-11	CARBON	10K	5%	1/4W	\triangle R568	1-215-882-00	METAL OXIDE	22	5%	2W
R517	1-249-425-11	CARBON	4.7K	5%	1/4W	R571	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R518	1-249-427-11	CARBON	6.8K	5%	1/4W	R572	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R519	1-249-427-11	CARBON	6.8K	5%	1/4W	\triangle R601	1-219-513-11	CARBON	4.7M	5%	1/2W
\triangle R520	1-215-861-00	METAL OXIDE	47	5%	1W	\triangle R602	1-249-389-11	CARBON	4.7	5%	1/4W
R521	1-249-411-11	CARBON	330	5%	1/4W	R603	1-215-485-00	METAL	470K	1%	1/4W
R522	1-249-415-11	CARBON	680	5%	1/4W	\triangle R605	1-205-998-11	CEMENTED	1	5%	10W
R523	1-216-073-00	RES-CHIP	10K	5%	1/10W	\triangle R606	1-205-998-11	CEMENTED	1	5%	10W
R524	1-249-429-11	CARBON	10K	5%	1/4W	R607	1-215-859-00	METAL OXIDE	22	5%	1W
\triangle R525	1-208-802-11	METAL CHIP	6.8K	0.50%	1/10W	R608	1-240-205-11	CARBON	22M	5%	1/2W
R526	1-208-814-91	METAL CHIP	22K	0.50%	1/10W	R609	1-216-049-11	RES-CHIP	1K	5%	1/10W
R527	1-216-079-00	RES-CHIP	18K	5%	1/10W	R610	1-216-073-00	RES-CHIP	10K	5%	1/10W
R528	1-249-421-11	CARBON	2.2K	5%	1/4W	R611	1-216-089-11	RES-CHIP	47K	5%	1/10W
R529	1-216-101-00	RES-CHIP	150K	5%	1/10W	R612	1-216-045-00	RES-CHIP	680	5%	1/10W
R530	1-216-091-00	RES-CHIP	56K	5%	1/10W	\triangle R613	1-219-512-11	CARBON	2.2M	5%	1/2W
R532	1-215-435-00	METAL	3.9K	1%	1/4W	R614	1-249-413-11	CARBON	470	5%	1/4W
R533	1-215-461-00	METAL	47K	1%	1/4W						
R534	1-215-466-00	METAL	75K	1%	1/4W						
R535	1-249-441-11	CARBON	100K	5%	1/4W						



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REF.NO.	PART NO.	DESCRIPTION	VALUES			REF.NO.	PART NO.	DESCRIPTION	VALUES		
\triangle R616	1-260-302-51	CARBON	6.8	5%	1/2W	THERMISTOR					
R617	1-216-009-91	RES-CHIP	22	5%	1/10W	\triangle THP601	1-809-539-11	THERMISTOR, POSITIVE			
\triangle R626	1-220-926-11	FUSIBLE	0.47	10%	1/2W	TUNER					
R627	1-215-483-00	METAL	390K	1%	1/4W	\triangle TU101	8-598-501-30	TUNER, FSS BTF-FA402			
R630	1-249-421-11	CARBON	2.2K	5%	1/4W	VARISTOR					
\triangle R632	1-216-361-00	METAL OXIDE	0.22	5%	2W	\triangle VDR601	1-803-585-11	VARISTOR ENE271D-10A			
R633	1-249-415-11	CARBON	680	5%	1/4W	MB					
R634	1-216-073-00	RES-CHIP	10K	5%	1/10W	*	A-1304-197-A	MB (VAR) BOARD, MOUNTED			
R635	1-216-057-00	RES-CHIP	2.2K	5%	1/10W	CAPACITOR					
R638	1-249-399-11	CARBON	33	5%	1/4W	C1005	1-163-259-91	CERAMIC CHIP	220pF	5%	50V
R639	1-249-421-11	CARBON	2.2K	5%	1/4W	C1008	1-126-964-11	ELECT	10 μ F	20%	50V
R640	1-249-417-11	CARBON	1K	5%	1/4W	C1010	1-163-035-00	CERAMIC CHIP	0.047 μ F		50V
\triangle R641	1-216-369-00	METAL OXIDE	1	5%	2W	C1011	1-163-259-91	CERAMIC CHIP	220pF	5%	50V
R642	1-216-089-11	RES-CHIP	47K	5%	1/10W	C1012	1-126-960-11	ELECT	1 μ F	20%	50V
R643	1-249-419-11	CARBON	1.5K	5%	1/4W	C1013	1-163-009-11	CERAMIC CHIP	0.001 μ F	10%	50V
R644	1-247-843-11	CARBON	3.3K	5%	1/4W	C1014	1-130-495-00	MYLAR	0.1 μ F	5%	50V
R645	1-215-898-11	METAL OXIDE	10K	5%	2W	C1015	1-163-231-11	CERAMIC CHIP	15pF	5%	50V
R646	1-249-419-11	CARBON	1.5K	5%	1/4W	C1016	1-163-231-11	CERAMIC CHIP	15pF	5%	50V
R648	1-215-908-00	METAL OXIDE	33	5%	3W	C1018	1-126-960-11	ELECT	1 μ F	20%	50V
R650	1-216-387-11	METAL OXIDE	0.68	5%	3W	C1019	1-104-664-11	ELECT	47 μ F	20%	25V
R653	1-216-049-11	RES-CHIP	1K	5%	1/10W	C1020	1-164-161-11	CERAMIC CHIP	0.0022 μ F	10%	50V
R655	1-216-049-11	RES-CHIP	1K	5%	1/10W	C1021	1-163-259-91	CERAMIC CHIP	220pF	5%	50V
R656	1-249-429-11	CARBON	10K	5%	1/4W	C1022	1-163-135-00	CERAMIC CHIP	560pF	5%	50V
R658	1-216-387-11	METAL OXIDE	0.68	5%	3W	C1023	1-163-009-11	CERAMIC CHIP	0.001 μ F	10%	50V
R659	1-215-857-11	METAL OXIDE	10	5%	1W	C1024	1-163-259-91	CERAMIC CHIP	220pF	5%	50V
\triangle R660	1-215-924-00	METAL OXIDE	15K	5%	3W	C1026	1-163-259-91	CERAMIC CHIP	220pF	5%	50V
R661	1-216-057-00	RES-CHIP	2.2K	5%	1/10W	C1027	1-163-038-11	CERAMIC CHIP	0.1 μ F		25V
R663	1-216-081-00	RES-CHIP	22K	5%	1/10W	C1028	1-163-259-91	CERAMIC CHIP	220pF	5%	50V
RELAY						C1029	1-164-161-11	CERAMIC CHIP	0.0022 μ F	10%	50V
\triangle RY601	1-755-198-11	RELAY				C1030	1-126-963-11	ELECT	4.7 μ F	20%	50V
\triangle RY602	1-755-266-11	RELAY, AC POWER				C1031	1-163-009-11	CERAMIC CHIP	0.001 μ F	10%	50V
SWITCH						C1032	1-163-133-00	CERAMIC CHIP	470pF	5%	50V
SW502	1-572-707-11	SWITCH LEVER				C1034	1-163-259-91	CERAMIC CHIP	220pF	5%	50V
TRANSFORMER						C1035	1-163-133-00	CERAMIC CHIP	470pF	5%	50V
\triangle T501	1-435-374-11	TRANSFORMER, FERRITE (HDT)				C1041	1-126-941-11	ELECT	470 μ F	20%	25V
\triangle T505	1-453-339-11	FBT ASSY NX-1912//M3E4				C1042	1-164-161-11	CERAMIC CHIP	0.0022 μ F	10%	50V
\triangle T602	1-431-419-11	TRANSFORMER, LINE FILTER				C1043	1-163-809-11	CERAMIC CHIP	0.047 μ F	10%	25V
\triangle T603	1-433-806-11	TRANSFORMER, REGULAT				C1048	1-137-194-81	FILM	0.47 μ F	5%	50V
\triangle T604	1-431-852-11	TRANSFORMER, CONVERTER (SRT)				C1049	1-163-017-00	CERAMIC CHIP	.0047 μ F	10%	50V
THERMISTOR						C1050	1-163-037-11	CERAMIC CHIP	0.022 μ F	10%	50V
\triangle TH601	1-803-586-11	THERMISTOR, NTC				C1053	1-163-229-11	CERAMIC CHIP	12pF	5%	50V
						C1054	1-163-259-91	CERAMIC CHIP	220pF	5%	50V



REF.NO.	PART NO.	DESCRIPTION	VALUES		REF.NO.	PART NO.	DESCRIPTION	VALUES			
C1055	1-163-229-11	CERAMIC CHIP	12pF	5%	50V	C1349	1-163-021-91	CERAMIC CHIP	0.01μF	10%	50V
C1056	1-163-009-11	CERAMIC CHIP	0.001μF	10%	50V	C1350	1-163-021-91	CERAMIC CHIP	0.01μF	10%	50V
C1058	1-163-009-11	CERAMIC CHIP	0.001μF	10%	50V	C1351	1-126-963-11	ELECT	4.7μF	20%	50V
C1060	1-163-009-11	CERAMIC CHIP	0.001μF	10%	50V	C1352	1-104-664-11	ELECT	47μF	20%	25V
C1066	1-163-009-11	CERAMIC CHIP	0.001μF	10%	50V	C1353	1-126-964-11	ELECT	10μF	20%	50V
C1068	1-163-009-11	CERAMIC CHIP	0.001μF	10%	50V	C1354	1-137-194-81	FILM	0.47μF	5%	50V
C1071	1-163-009-11	CERAMIC CHIP	0.001μF	10%	50V	C1355	1-126-767-11	ELECT	1000μF	20%	16V
C1072	1-163-259-91	CERAMIC CHIP	220pF	5%	50V	C1356	1-163-133-00	CERAMIC CHIP	470pF	5%	50V
C1073	1-163-259-91	CERAMIC CHIP	220pF	5%	50V	C1357	1-163-038-11	CERAMIC CHIP	0.1μF		25V
C1074	1-163-259-91	CERAMIC CHIP	220pF	5%	50V	C1358	1-126-963-11	ELECT	4.7μF	20%	50V
C1075	1-126-941-11	ELECT	470μF	20%	25V	C1359	1-126-964-11	ELECT	10μF	20%	50V
C1076	1-126-959-11	ELECT	0.47μF	20%	50V	C1361	1-163-231-11	CERAMIC CHIP	15pF	5%	50V
C1077	1-126-964-11	ELECT	10μF	20%	50V	C1364	1-163-233-11	CERAMIC CHIP	18pF	5%	50V
C1099	1-163-009-11	CERAMIC CHIP	0.001μF	10%	50V	C1366	1-126-964-11	ELECT	10μF	20%	50V
C1304	1-126-959-11	ELECT	0.47μF	20%	50V	C1375	1-163-034-00	CERAMIC CHIP	0.033μF		50V
C1305	1-163-021-91	CERAMIC CHIP	0.01μF	10%	50V	C1376	1-163-243-11	CERAMIC CHIP	47pF	5%	50V
C1306	1-126-933-11	ELECT	100μF	20%	16V	C1377	1-126-960-11	ELECT	1μF	20%	50V
C1307	1-163-021-91	CERAMIC CHIP	0.01μF	10%	50V	C1378	1-163-038-11	CERAMIC CHIP	0.1μF		25V
C1308	1-126-933-11	ELECT	100μF	20%	16V	C1379	1-163-021-91	CERAMIC CHIP	0.01μF	10%	50V
C1309	1-163-021-91	CERAMIC CHIP	0.01μF	10%	50V	C1380	1-163-003-11	CERAMIC CHIP	330pF	10%	50V
C1310	1-163-021-91	CERAMIC CHIP	0.01μF	10%	50V	C1381	1-163-038-11	CERAMIC CHIP	0.1μF		25V
C1311	1-163-038-11	CERAMIC CHIP	0.1μF		25V	C1382	1-126-964-11	ELECT	10μF	20%	50V
C1313	1-163-021-91	CERAMIC CHIP	0.01μF	10%	50V	C1385	1-126-964-11	ELECT	10μF	20%	50V
C1315	1-163-021-91	CERAMIC CHIP	0.01μF	10%	50V	C1386	1-163-038-11	CERAMIC CHIP	0.1μF		25V
C1320	1-163-021-91	CERAMIC CHIP	0.01μF	10%	50V	C1387	1-163-133-00	CERAMIC CHIP	470pF	5%	50V
C1321	1-163-021-91	CERAMIC CHIP	0.01μF	10%	50V	C1392	1-163-231-11	CERAMIC CHIP	15pF	5%	50V
C1322	1-163-021-91	CERAMIC CHIP	0.01μF	10%	50V	C1394	1-104-664-11	ELECT	47μF	20%	25V
C1323	1-126-933-11	ELECT	100μF	20%	16V	C1399	1-163-243-11	CERAMIC CHIP	47pF	5%	50V
C1324	1-163-021-91	CERAMIC CHIP	0.01μF	10%	50V						
C1325	1-163-123-00	CERAMIC CHIP	180pF	5%	50V			CONNECTOR			
C1326	1-163-021-91	CERAMIC CHIP	0.01μF	10%	50V	* CN1001	1-564-511-11	PLUG,CONNECTOR		8P	
C1327	1-126-933-11	ELECT	100μF	20%	16V	* CN1002	1-560-124-00	PLUG,CONNECTOR (2.5MM)		4P	
C1328	1-163-227-11	CERAMIC CHIP	10pF	0.50pF	50V	CN1003	1-573-301-21	CONNECTOR, BOARD TO BOARD		20P	
C1329	1-163-010-11	CERAMIC CHIP	0.0012μF	10%	50V	CN1004	1-573-301-21	CONNECTOR, BOARD TO BOARD		20P	
C1330	1-163-231-11	CERAMIC CHIP	15pF	5%	50V	CN1303	1-900-805-12	CONNECTOR ASSY 9P BOARD			
C1331	1-163-021-91	CERAMIC CHIP	0.01μF	10%	50V			DIODE			
C1332	1-163-021-91	CERAMIC CHIP	0.01μF	10%	50V	D1001	8-719-069-54	DIODE UDZSTE-175.1B			
C1334	1-163-021-91	CERAMIC CHIP	0.01μF	10%	50V	D1005	8-719-109-89	DIODE MTZJ-T-77-5.6C			
C1335	1-163-021-91	CERAMIC CHIP	0.01μF	10%	50V	D1006	8-719-073-01	DIODE MA111-TX			
C1336	1-163-021-91	CERAMIC CHIP	0.01μF	10%	50V	D1010	8-719-069-60	DIODE UDZSTE-179.1B			
C1339	1-163-021-91	CERAMIC CHIP	0.01μF	10%	50V	D1011	8-719-073-01	DIODE MA111-TX			
C1340	1-126-963-11	ELECT	4.7μF	20%	50V	D1012	8-719-073-01	DIODE MA111-TX			
C1341	1-163-021-91	CERAMIC CHIP	0.01μF	10%	50V	D1013	8-719-069-60	DIODE UDZSTE-179.1B			
C1342	1-163-021-91	CERAMIC CHIP	0.01μF	10%	50V	D1014	8-719-073-01	DIODE MA111-TX			
C1343	1-163-038-11	CERAMIC CHIP	0.1μF		25V	D1301	8-719-914-44	DIODE DAP202K-T-146			
C1344	1-126-941-11	ELECT	470μF	20%	25V	D1310	8-719-069-54	DIODE UDZSTE-175.1B			
C1345	1-163-021-91	CERAMIC CHIP	0.01μF	10%	50V						



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REF.NO.	PART NO.	DESCRIPTION	VALUES	REF.NO.	PART NO.	DESCRIPTION	VALUES
FERRITE BEAD							
FB1302	1-412-911-11	FERRITE	0 μ H	Q1308	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX	
FILTER							
FL1301	1-239-847-11	FILTER, LOW PASS		Q1310	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX	
FL1302	1-239-847-11	FILTER, LOW PASS		Q1311	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX	
FL1303	1-239-847-11	FILTER, LOW PASS		Q1312	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX	
IC							
IC1001	8-759-824-80	IC M37273 μ F-306SP		Q1313	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX	
IC1003	8-759-699-33	IC M24C16-MN6T(A)		Q1315	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX	
\triangle IC1301	8-752-098-79	IC CXA2131CS		Q1316	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX	
IC1302	8-759-655-75	IC TC90A49P		Q1317	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX	
IC1304	8-759-353-00	IC NJM2534M(TE2)		Q1325	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX	
IC1305	8-759-658-02	IC BA3993F		Q1326	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX	
CHIP CONDUCTOR							
JR1002	1-216-295-11	SHORT		Q1327	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX	
JR1005	1-216-295-11	SHORT		Q1328	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX	
JR1018	1-216-295-11	SHORT		Q1329	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX	
JR1083	1-216-295-11	SHORT		Q1330	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX	
JR1088	1-216-295-11	SHORT		Q1331	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX	
JR1307	1-216-295-11	SHORT		Q1332	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX	
JR1321	1-216-295-11	SHORT		Q1336	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX	
COIL				RESISTOR			
L1001	1-412-032-11	INDUCTOR	100 μ H	R1001	1-216-089-11	RES-CHIP	47K 5% 1/10W
L1003	1-412-032-11	INDUCTOR	100 μ H	R1016	1-216-049-11	RES-CHIP	1K 5% 1/10W
L1004	1-408-963-11	INDUCTOR	2.7 μ H	R1017	1-216-025-11	RES-CHIP	100 5% 1/10W
L1302	1-412-029-11	INDUCTOR	10 μ H	R1018	1-249-429-11	CARBON	10K 5% 1/4W
L1303	1-412-029-11	INDUCTOR	10 μ H	R1019	1-216-045-00	RES-CHIP	680 5% 1/10W
L1304	1-412-029-11	INDUCTOR	10 μ H	R1021	1-216-121-11	RES-CHIP	1M 5% 1/10W
L1305	1-412-029-11	INDUCTOR	10 μ H	R1022	1-216-073-00	RES-CHIP	10K 5% 1/10W
L1310	1-412-029-11	INDUCTOR	10 μ H	R1023	1-216-073-00	RES-CHIP	10K 5% 1/10W
L1311	1-412-031-11	INDUCTOR	47 μ H	R1025	1-208-814-91	METAL CHIP	22K 0.50% 1/10W
L1315	1-412-029-11	INDUCTOR	10 μ H	R1026	1-216-065-91	RES-CHIP	4.7K 5% 1/10W
TRANSISTOR							
Q1001	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX		R1027	1-216-041-00	RES-CHIP	470 5% 1/10W
Q1002	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX		R1028	1-216-045-00	RES-CHIP	680 5% 1/10W
Q1003	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX		R1029	1-216-113-00	RES-CHIP	470K 5% 1/10W
Q1009	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX		R1030	1-216-049-11	RES-CHIP	1K 5% 1/10W
Q1010	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX		R1031	1-216-041-00	RES-CHIP	470 5% 1/10W
Q1011	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX		R1032	1-216-065-91	RES-CHIP	4.7K 5% 1/10W
Q1301	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX		R1033	1-216-081-00	RES-CHIP	22K 5% 1/10W
Q1302	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX		R1034	1-216-043-91	RES-CHIP	560 5% 1/10W
Q1306	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX		R1035	1-216-049-11	RES-CHIP	1K 5% 1/10W
Q1307	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX		R1036	1-216-033-00	RES-CHIP	220 5% 1/10W
				R1037	1-216-033-00	RES-CHIP	220 5% 1/10W
				R1038	1-247-807-31	CARBON	100 5% 1/4W
				R1040	1-216-033-00	RES-CHIP	220 5% 1/10W
				R1041	1-216-073-00	RES-CHIP	10K 5% 1/10W
				R1042	1-249-414-11	CARBON	560 5% 1/4W
				R1043	1-216-071-00	RES-CHIP	8.2K 5% 1/10W
				R1044	1-216-065-91	RES-CHIP	4.7K 5% 1/10W



REF.NO.	PART NO.	DESCRIPTION	VALUES			REF.NO.	PART NO.	DESCRIPTION	VALUES		
R1045	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R1106	1-216-073-00	RES-CHIP	10K	5%	1/10W
R1046	1-249-425-11	CARBON	4.7K	5%	1/4W	R1109	1-216-073-00	RES-CHIP	10K	5%	1/10W
R1047	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R1110	1-216-059-00	RES-CHIP	2.7K	5%	1/10W
R1048	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R1111	1-216-085-00	RES-CHIP	33K	5%	1/10W
R1049	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R1300	1-216-049-11	RES-CHIP	1K	5%	1/10W
R1050	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R1301	1-216-053-00	RES-CHIP	1.5K	5%	1/10W
R1052	1-216-033-00	RES-CHIP	220	5%	1/10W	R1302	1-216-041-00	RES-CHIP	470	5%	1/10W
R1053	1-216-033-00	RES-CHIP	220	5%	1/10W	R1303	1-216-025-11	RES-CHIP	100	5%	1/10W
R1054	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R1304	1-216-049-11	RES-CHIP	1K	5%	1/10W
R1055	1-216-049-11	RES-CHIP	1K	5%	1/10W	R1306	1-249-409-11	CARBON	220	5%	1/4W
R1056	1-216-081-00	RES-CHIP	22K	5%	1/10W	R1308	1-216-033-00	RES-CHIP	220	5%	1/10W
R1057	1-216-049-11	RES-CHIP	1K	5%	1/10W	R1310	1-216-025-11	RES-CHIP	100	5%	1/10W
R1058	1-216-635-11	METAL CHIP	220	0.50%	1/10W	R1311	1-216-047-91	RES-CHIP	820	5%	1/10W
R1059	1-249-409-11	CARBON	220	5%	1/4W	R1312	1-208-806-11	METAL CHIP	10K	0.50%	1/10W
R1060	1-216-635-11	METAL CHIP	220	0.50%	1/10W	R1313	1-249-409-11	CARBON	220	5%	1/4W
R1061	1-249-409-11	CARBON	220	5%	1/4W	R1314	1-216-022-00	RES-CHIP	75	5%	1/10W
R1062	1-216-073-00	RES-CHIP	10K	5%	1/10W	R1315	1-216-053-00	RES-CHIP	1.5K	5%	1/10W
R1063	1-249-409-11	CARBON	220	5%	1/4W	R1316	1-216-295-11	SHORT			
R1064	1-216-025-11	RES-CHIP	100	5%	1/10W	R1319	1-216-022-00	RES-CHIP	75	5%	1/10W
R1065	1-216-033-00	RES-CHIP	220	5%	1/10W	R1320	1-247-807-31	CARBON	100	5%	1/4W
R1066	1-216-033-00	RES-CHIP	220	5%	1/10W	R1322	1-216-081-00	RES-CHIP	22K	5%	1/10W
R1067	1-216-033-00	RES-CHIP	220	5%	1/10W	R1323	1-247-807-31	CARBON	100	5%	1/4W
R1068	1-216-025-11	RES-CHIP	100	5%	1/10W	R1325	1-249-421-11	CARBON	2.2K	5%	1/4W
R1069	1-216-033-00	RES-CHIP	220	5%	1/10W	R1326	1-216-043-91	RES-CHIP	560	5%	1/10W
R1070	1-216-033-00	RES-CHIP	220	5%	1/10W	R1327	1-247-807-31	CARBON	100	5%	1/4W
R1071	1-249-429-11	CARBON	10K	5%	1/4W	R1328	1-216-067-00	RES-CHIP	5.6K	5%	1/10W
R1072	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R1329	1-216-091-00	RES-CHIP	56K	5%	1/10W
R1073	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R1330	1-216-081-00	RES-CHIP	22K	5%	1/10W
R1074	1-216-355-11	METAL OXIDE	3.3	5%	1W	R1331	1-216-049-11	RES-CHIP	1K	5%	1/10W
R1075	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R1332	1-216-043-91	RES-CHIP	560	5%	1/10W
R1076	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R1333	1-216-033-00	RES-CHIP	220	5%	1/10W
R1077	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R1334	1-216-025-11	RES-CHIP	100	5%	1/10W
R1078	1-216-049-11	RES-CHIP	1K	5%	1/10W	R1335	1-216-025-11	RES-CHIP	100	5%	1/10W
R1079	1-249-427-11	CARBON	6.8K	5%	1/4W	R1336	1-216-053-00	RES-CHIP	1.5K	5%	1/10W
R1080	1-249-427-11	CARBON	6.8K	5%	1/4W	R1338	1-216-091-00	RES-CHIP	56K	5%	1/10W
R1081	1-249-427-11	CARBON	6.8K	5%	1/4W	R1342	1-216-025-11	RES-CHIP	100	5%	1/10W
R1082	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R1344	1-216-025-11	RES-CHIP	100	5%	1/10W
R1084	1-216-045-00	RES-CHIP	680	5%	1/10W	R1345	1-216-049-11	RES-CHIP	1K	5%	1/10W
R1085	1-216-045-00	RES-CHIP	680	5%	1/10W	R1346	1-249-409-11	CARBON	220	5%	1/4W
R1086	1-216-045-00	RES-CHIP	680	5%	1/10W	R1347	1-216-025-11	RES-CHIP	100	5%	1/10W
R1087	1-216-061-00	RES-CHIP	3.3K	5%	1/10W	R1348	1-247-807-31	CARBON	100	5%	1/4W
R1090	1-249-409-11	CARBON	220	5%	1/4W	R1350	1-216-073-00	RES-CHIP	10K	5%	1/10W
R1095	1-216-061-00	RES-CHIP	3.3K	5%	1/10W	R1351	1-216-067-00	RES-CHIP	5.6K	5%	1/10W
R1098	1-216-033-00	RES-CHIP	220	5%	1/10W	R1352	1-216-049-11	RES-CHIP	1K	5%	1/10W
R1099	1-208-798-11	METAL CHIP	4.7K	0.50%	1/10W	R1355	1-216-025-11	RES-CHIP	100	5%	1/10W
R1104	1-216-073-00	RES-CHIP	10K	5%	1/10W	R1356	1-216-067-00	RES-CHIP	5.6K	5%	1/10W
R1105	1-216-073-00	RES-CHIP	10K	5%	1/10W	R1357	1-216-043-91	RES-CHIP	560	5%	1/10W



NOTE: The components identified by shading and Δ mark are critical for safety. Replace only with part number specified.

NOTE: Les composants identifiés par un trame et une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifique.

REF.NO.	PART NO.	DESCRIPTION	VALUES			REF.NO.	PART NO.	DESCRIPTION	VALUES		
R1358	1-216-057-00	RES-CHIP	2.2K	5%	1/10W	R1414	1-216-049-11	RES-CHIP	1K	5%	1/10W
R1359	1-247-807-31	CARBON	100	5%	1/4W	R1415	1-216-049-11	RES-CHIP	1K	5%	1/10W
R1360	1-216-041-00	RES-CHIP	470	5%	1/10W	R1416	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R1361	1-216-295-11	SHORT				R1417	1-216-035-00	RES-CHIP	270	5%	1/10W
R1362	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R1418	1-216-045-00	RES-CHIP	680	5%	1/10W
R1363	1-216-043-91	RES-CHIP	560	5%	1/10W	R1419	1-216-295-11	SHORT			
R1364	1-247-807-31	CARBON	100	5%	1/4W	R1442	1-216-107-00	RES-CHIP	270K	5%	1/10W
R1365	1-216-025-11	RES-CHIP	100	5%	1/10W						
R1366	1-247-807-31	CARBON	100	5%	1/4W						
R1367	1-247-807-31	CARBON	100	5%	1/4W						
R1368	1-216-057-00	RES-CHIP	2.2K	5%	1/10W						
R1372	1-216-295-11	SHORT									
R1374	1-216-049-11	RES-CHIP	1K	5%	1/10W						
R1375	1-216-295-11	SHORT									
R1376	1-216-295-11	SHORT									
R1378	1-216-295-11	SHORT									
R1379	1-216-057-00	RES-CHIP	2.2K	5%	1/10W						
R1380	1-216-057-00	RES-CHIP	2.2K	5%	1/10W						
R1381	1-216-057-00	RES-CHIP	2.2K	5%	1/10W						
R1382	1-249-441-11	CARBON	100K	5%	1/4W						
R1383	1-249-441-11	CARBON	100K	5%	1/4W						
R1384	1-249-441-11	CARBON	100K	5%	1/4W						
R1385	1-216-113-00	RES-CHIP	470K	5%	1/10W						
R1386	1-216-073-00	RES-CHIP	10K	5%	1/10W						
R1387	1-216-089-11	RES-CHIP	47K	5%	1/10W						
R1388	1-216-117-00	RES-CHIP	680K	5%	1/10W						
R1389	1-216-071-00	RES-CHIP	8.2K	5%	1/10W						
R1390	1-216-025-11	RES-CHIP	100	5%	1/10W						
R1391	1-216-073-00	RES-CHIP	10K	5%	1/10W						
R1392	1-216-295-11	SHORT									
R1393	1-216-069-00	RES-CHIP	6.8K	5%	1/10W						
R1394	1-216-033-00	RES-CHIP	220	5%	1/10W						
R1395	1-216-033-00	RES-CHIP	220	5%	1/10W						
R1396	1-249-409-11	CARBON	220	5%	1/4W						
R1397	1-249-409-11	CARBON	220	5%	1/4W						
R1398	1-216-049-11	RES-CHIP	1K	5%	1/10W						
R1399	1-216-073-00	RES-CHIP	10K	5%	1/10W						
R1400	1-216-295-11	SHORT									
R1401	1-216-073-00	RES-CHIP	10K	5%	1/10W						
R1402	1-216-065-91	RES-CHIP	4.7K	5%	1/10W						
R1403	1-216-049-11	RES-CHIP	1K	5%	1/10W						
R1404	1-216-073-00	RES-CHIP	10K	5%	1/10W						
R1406	1-216-049-11	RES-CHIP	1K	5%	1/10W						
R1407	1-216-065-91	RES-CHIP	4.7K	5%	1/10W						
R1409	1-249-414-11	CARBON	560	5%	1/4W						
R1410	1-216-295-11	SHORT									
R1411	1-216-033-00	RES-CHIP	220	5%	1/10W						
R1413	1-216-091-00	RES-CHIP	56K	5%	1/10W						
R1414	1-216-049-11	RES-CHIP	1K	5%	1/10W						
R1415	1-216-049-11	RES-CHIP	1K	5%	1/10W						
R1416	1-216-057-00	RES-CHIP	2.2K	5%	1/10W						
R1417	1-216-035-00	RES-CHIP	270	5%	1/10W						
R1418	1-216-045-00	RES-CHIP	680	5%	1/10W						
R1419	1-216-295-11	SHORT									
R1442	1-216-107-00	RES-CHIP	270K	5%	1/10W						
						CRYSTAL					
X1001	1-767-487-11	VIBRATOR, CRYSTAL									
X1304	1-567-505-11	OSCILLATOR, CRYSTAL									
						CB					
						*	A-1332-062-A	CB (VAR) BOARD, MOUNTED			
							4-382-854-11	SCREW (M3X10), P, SW (+)			
						CAPACITOR					
C701	1-104-664-11	ELECT	47µF	20%	25V						
C702	1-136-165-00	FILM	0.1µF	5%	50V						
C703	1-104-664-11	ELECT	47µF	20%	25V						
C704	1-107-649-11	ELECT	2.2µF	20%	250V						
C705	1-107-652-11	ELECT	10µF	20%	250V						
C706	1-137-528-11	MYLAR	0.1µF	10%	250V						
C707	1-162-114-00	CERAMIC	.0047µF	2KV							
C708	1-136-165-00	FILM	0.1µF	5%	50V						
C709	1-126-934-11	ELECT	220µF	20%	16V						
C710	1-126-964-11	ELECT	10µF	20%	50V						
						CONNECTOR					
* CN701	1-564-506-11	PLUG,CONNECTOR	3P								
CN702	1-695-915-11	TAB (CONTACT)									
CN704	1-785-879-11	CONNECTOR, ONE TOUCH									
* CN705	1-564-512-11	PLUG, CONNECTOR	9P								
* CN706	1-564-509-11	PLUG,CONNECTOR	6P								
						DIODE					
D701	8-719-901-83	DIODE 1SS83TD									
D702	8-719-901-83	DIODE 1SS83TD									
D703	8-719-901-83	DIODE 1SS83TD									
D704	8-719-302-43	DIODE RGP10GPKG23									
						IC					
IC701	8-759-803-42	IC LA6500-FA									
IC702	8-759-562-43	IC TDA6108JF/N1B									
						JACK					
Δ J701	1-451-470-21	SOCKET, CRT									



REF.NO.	PART NO.	DESCRIPTION	VALUES	REF.NO.	PART NO.	DESCRIPTION	VALUES
COIL				RESISTOR			
L701	1-408-613-31	INDUCTOR	68μH	R2201	1-249-415-11	CARBON	680 5% 1/4W
TRANSISTOR				R2202	1-249-416-11	CARBON	820 5% 1/4W
Q700	8-729-423-33	TRANSISTOR 2SC3311A-QRSTA		R2203	1-249-421-11	CARBON	2.2K 5% 1/4W
Q701	8-729-423-33	TRANSISTOR 2SC3311A-QRSTA		R2204	1-249-427-11	CARBON	6.8K 5% 1/4W
RESISTOR				R2205	1-249-417-11	CARBON	1K 5% 1/4W
R700	1-249-433-11	CARBON	22K 5% 1/4W	R2207	1-247-807-31	CARBON	100 5% 1/4W
R701	1-249-429-11	CARBON	10K 5% 1/4W	SWITCH			
R702	1-249-409-11	CARBON	220 5% 1/4W	S2201	1-762-196-21	SWITCH, TACTILE	
R703	1-247-807-31	CARBON	100 5% 1/4W	S2202	1-762-196-21	SWITCH, TACTILE	
R704	1-249-421-11	CARBON	2.2K 5% 1/4W	S2203	1-762-196-21	SWITCH, TACTILE	
R705	1-249-429-11	CARBON	10K 5% 1/4W	S2204	1-762-196-21	SWITCH, TACTILE	
R706	1-249-381-11	CARBON	1 5% 1/4W	S2205	1-762-196-21	SWITCH, TACTILE	
R707	1-249-383-11	CARBON	1.5 5% 1/4W	S2206	1-762-196-21	SWITCH, TACTILE	
R708	1-247-807-31	CARBON	100 5% 1/4W	HD			
R709	1-247-807-31	CARBON	100 5% 1/4W	*	A-1372-816-A	HD (COM) BOARD, MOUNTED	
R710	1-247-807-31	CARBON	100 5% 1/4W	CAPACITOR			
R711	1-260-328-11	CARBON	1K 5% 1/2W	C2211	1-126-960-11	ELECT	1μF 20% 50V
R712	1-260-328-11	CARBON	1K 5% 1/2W	C2212	1-126-940-11	ELECT	330μF 20% 25V
R713	1-260-328-11	CARBON	1K 5% 1/2W	C2222	1-104-664-11	ELECT	47μF 20% 25V
R714	1-260-087-11	CARBON	100 5% 1/2W	CONNECTOR			
R715	1-260-132-11	CARBON	560K 5% 1/2W	* CN2210	1-564-523-11	PLUG,CONNECTOR	8P
R716	1-260-123-11	CARBON	100K 5% 1/2W	* CN2211	1-564-518-11	PLUG,CONNECTOR	3P
R717	1-216-373-11	METAL OXIDE	2.2 5% 2W	* CN2212	1-564-518-11	PLUG,CONNECTOR	3P
R719	1-215-884-11	METAL OXIDE	47 5% 2W	* CN2213	1-564-522-11	PLUG,CONNECTOR	7P
R720	1-249-421-11	CARBON	2.2K 5% 1/4W	DIODE			
R721	1-249-421-11	CARBON	2.2K 5% 1/4W	D2211	8-719-108-12	DIODE RD9.1EW-T1	
VARIABLE RESISTOR				D2212	8-719-110-17	DIODE MTZJ-T-77-10B	
RV701	1-241-656-11	RES, ADJ, METAL FILM	110M	D2213	8-719-924-13	DIODE MTZJ-T-77-22B	
HC				JACK			
*	A-1372-814-A	HC (VAR) BOARD, MOUNTED		J2211	1-794-266-21	JACK, PIN 2P	
CONNECTOR				J2212	1-568-267-21	JACK	
* CN2201	1-564-522-11	PLUG,CONNECTOR	7P	RESISTOR			
DIODE				R2211	1-249-419-11	CARBON	1.5K 5% 1/4W
D2201	8-719-057-09	DIODE LNJ801LPDJA		R2212	1-249-421-11	CARBON	2.2K 5% 1/4W
IC				R2213	1-249-427-11	CARBON	6.8K 5% 1/4W
IC2201	8-742-211-20	HYB IC SBX3071-71		R2215	1-247-895-91	CARBON	470K 5% 1/4W
				R2216	1-249-425-11	CARBON	4.7K 5% 1/4W
				R2217	1-249-409-11	CARBON	220 5% 1/4W
				R2219	1-249-425-11	CARBON	4.7K 5% 1/4W

REF.NO.	PART NO.	DESCRIPTION	VALUES	REF.NO.	PART NO.	DESCRIPTION	VALUES
<u>SWITCH</u>							
S2211	1-692-431-21	SWITCH, TACTILE					
S2212	1-692-431-21	SWITCH, TACTILE					
S2213	1-692-431-21	SWITCH, TACTILE					
S2214	1-692-431-21	SWITCH, TACTILE					
<u>ACCESSORIES AND PACKING MATERIAL</u>							
*	4-041-254-01	BAG, PROTECTION					
*	4-075-175-03	CUSHION ASSY, LOWER					
*	4-075-174-04	CUSHION ASSY, UPPER					
*	4-075-183-04	CARTON, INDIVIDUAL					
	4-075-509-21	MANUAL, INSTRUCTION(English)					
	4-075-509-31	MANUAL, INSTRUCTION(French)					
<u>REMOTE COMMANDER</u>							
	1-418-854-11	REMOTE COMMANDER (RM-Y172) (KV-13FM13 only)					
	1-476-231-11	REMOTE COMMANDER (RM-Y172) (KV-13FM14 only)					
	3-709-322-11	COVER, BATTERY (KV-13FM14 only)					
	3-709-322-21	COVER, BATTERY (KV-13FM13 only)					

PRINTING THE SERVICE MANUAL

The PDF of this service manual is not designed to be printed from cover to cover. The pages vary in size, and must therefore be printed in sections based on page dimensions.

NON-SCHEMATIC PAGES

Data that does NOT INCLUDE schematic diagrams are formatted to 8.5 x 11 inches and can be printed on standard letter-size and/or A4-sized paper.

SCHEMATIC DIAGRAMS

The schematic diagram pages are provided in two ways, full size and tiled. The full-sized schematic diagrams are formatted on paper sizes between 8.5" x 11" and 18" x 30" depending upon each individual diagram size. Those diagrams that are LARGER than 11" x 17" in full-size mode have been tiled for your convenience and can be printed on standard 11" x 17" (tabloid-size) paper, and reassembled.

TO PRINT FULL SIZE SCHEMATIC DIAGRAMS


If you have access to a large paper plotter or printer capable of outputting the full-sized diagrams, output as follows:

- 1) Note the page size(s) of the schematics you want to output as indicated in the middle window at the bottom of the viewing screen.
- 2) Go to the File menu and select Print Set-up. Choose the printer name and driver for your large format printer. Confirm that the printer settings are set to output the indicated page size or larger.
- 3) Close the Print Set Up screen and return to the File menu. Select "Print..." Input the page number of the schematic(s) you want to print in the print range window. Choose OK.

TO PRINT TILED VERSION OF SCHEMATICS



Schematic pages that are larger than 11" x 17" full-size are provided in a 11" x 17" printable tiled format near the end of the document. These can be printed to tabloid-sized paper and assembled to full-size for easy viewing.


If you have access to a printer capable of outputting the tabloid size (11" x 17") paper, then output the tiled version of the diagram as follows:

- 1) Note the page number(s) of the schematics you want to output as indicated in the middle window at the bottom of the viewing screen.
- 2) Go to the File menu and select Print Set-up. Choose the printer name and driver for your printer. Confirm that the plotter settings are set to output 11" x 17", or tabloid size paper in landscape () mode.
- 3) Close the Print Set Up screen and return to the File menu. Select "Print..." Input the page number of the schematic(s) you want to print in the print range window. Choose OK.

TO PRINT SPECIFIC SECTIONS OF A SCHEMATIC

To print just a particular section of a PDF, rather than a full page, access the Graphics Select tool in the Acrobat Reader tool bar.

- 1) To view the Graphics Select Tool, press and HOLD the mouse button over the Text Select Tool which looks like: . This tool will expand to reveal to additional tools. Choose the Graphics Select tool by placing the cursor over the button on of the far right that looks like: 
- 2) After selecting the Graphics Select Tool, place your cursor in the document window and the cursor will change to a plus (+) symbol. Click and drag the cursor over the area you want to print. When you release the mouse button, a marquee (or dotted lined box) will be displayed outlining the area you selected.
- 3) With the marquee in place, go to the file menu and select the "Print..." option. When the print window appears, choose the option under the section called "Print Range" which says "Selected Graphic".

Select OK and the output will print only the area that you outlined with the marquee. 

(continued >)

ON-SCREEN SEARCH OPTION

All of the text within the service manual PDF is content searchable. This means that you can enter any text, word, phrase or reference number that appears in the manual, and the PDF software will search, find and move the cursor to the location where you requested text first appears. This feature can be particularly useful in locating components on a specific schematic or printed wire circuit board (PWB) diagrams.

Follow these steps to effectively locate a component on a schematic diagram:

- 1) Locate the schematic you want to search by clicking on the corresponding bookmark on the left side of the screen. The view on the right of the screen will then jump to the desired schematic page.
- 2) Magnify the diagram to at least 400% before conducting a component search. This will enable you to easily view the reference number when it is highlighted on screen. To do this, click on the magnifying glass button on the tool bar at the top of the screen. Move the cursor over the diagram and RIGHT click you mouse. Select the 400% magnification option on the pop-up menu. Click on the button with the icon of the open hand to deactivate the magnification tool
- 3) Search the diagram (or the entire manual) by clicking on the binocular button tool at the top of the screen. The "Find" window will appear and allow you to type in your desired text. Type in a reference designator, such as R502, and click on the "Find" button. If the component is not on the diagram, but is listed anywhere else in the manual, the cursor will jump to the first location the text is found in the file. To find another instance of that same text, click on the binocular button again and select "Find Again."